



***Frontier Hard Chrome
Event 11 Long-Term Monitoring Report
(June 2007 Results)***

Department of Ecology Contract: C0500198

August 2007



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**FRONTIER HARD CHROME
LONG-TERM MONITORING REPORT
EVENT 11—JUNE 2007
VANCOUVER, WASHINGTON**

Prepared for

**Washington State Department of Ecology
PO Box 47600
Olympia, Washington 98504**

Contract No. C0500198

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SECTION 1

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This Long Term Monitoring Report has been prepared under Contract C0500198 to the State of Washington Department of Ecology (Ecology) for Long Term Monitoring of the Frontier Hard Chrome (FHC) site located in Vancouver Washington.

This report describes the sampling activities performed and analytical results obtained during “Event 11” of the long-term groundwater monitoring program at FHC. Sampling activities for Event 11 were conducted during June 2007.

The FHC site was the subject of a remedial action conducted during the summer of 2003. The purpose of the remedial action (RA) was to treat the site’s chromium-contaminated soil and groundwater to cleanup levels specified in the Record of Decision. Long term monitoring is required to track offsite plume concentrations as well as show that the remedy is maintaining its operational functionality.

The first 3 groundwater monitoring events (Events 1 through 3) were conducted for the United States Environmental Protection Agency (EPA). In October 2004, responsibility for this site was turned over to Ecology. Ecology contracted Weston Solutions, Inc. (Weston) to perform the next 2 rounds of monitoring (Events 4 and 5) as a result of Weston’s familiarity with this site and the associated property owners. Ecology amended Weston’s contract in February 2006 and again in July 2007 to perform 14 additional rounds of quarterly monitoring with the last to be completed in June 2009. This report documents the results from the last round of sampling under Weston’s Contract Amendment #1 with Ecology. Future groundwater monitoring will be performed under Contract Amendment #3.

All Event 11 work was performed in accordance with project work plan titled *Frontier Hard Chrome, Long Term Monitoring Plan* (Weston 2004).

1.2 BACKGROUND AND PROBLEM DEFINITION

1.2.1 Site Background

The FHC site is located in southeastern Vancouver, Washington (Figure 1). The facility address is 113 “Y” Street, Vancouver, Washington. The site is located in the Section 25, Township 2 north, Range 1 east, Willamette Meridian in Clark County, Washington. The location in latitude and longitude coordinates is 45 degrees, 37 minutes, 19 seconds north by 122 degrees, 38 minutes 45 seconds east (Degrees, Minutes, Seconds [DMS]). The site was previously occupied by several metals fabricating businesses and was used for storage and as a staging area for a

neighboring business. Currently, no buildings exist on the site and the site is vacant. A truck driving school is operating on the parcel south of the site.

The FHC site proper covers approximately 0.5 acres and is bordered to the east by Grand Avenue, to the south by Test-U, and to the west by “Y” Street.

Work began on the remedial design in October 2001. The remedial design was completed in February 2003. The remedial action, consisting of building demolition, treatment of source area soil and groundwater, and installation of an in-situ redox manipulation (ISRM) treatment wall (to treat hexavalent chromium), was completed in September 2003.

1.2.2 Problem Definition

The goal of the remedial action was to treat source area soil and groundwater to reduce hexavalent chromium concentrations such that groundwater downgradient of the site would attenuate to chromium concentrations less than 50 micrograms per liter (ug/L). To demonstrate this, groundwater quality was monitored in two areas. The first area consisted of locations immediately within and down gradient of the ISRM wall. Wells located within and just down gradient of the wall were monitored to ensure the continued operational functionality of the ISRM Treatment Wall. The second area monitored consisted of the historical chromium contaminated groundwater plume located down gradient of the ISRM wall. This down gradient plume did not receive treatment during the remedial action and was monitored to track the long-term expected reduction in chromium concentration as a result of completing the remedial action and elimination of the source of hexavalent chromium.

Long-term groundwater monitoring is required by the site’s Record of Decision.

1.3 MONITORING SCHEDULE

Sampling events performed for EPA were conducted approximately quarterly for the first year after completion of the remedial action. Planned sampling events were completed in February, April, and August 2004. The sampling event performed the week of 16 August 2004 concluded monitoring for approximately one year after the remedial action was completed.

In September/October 2004, monitoring of the FHC site was turned over to the Washington State Department of Ecology. Sampling of the site groundwater for Ecology (Original Contract) occurred in May 2005 and again in December 2005. In February 2006, Ecology amended Weston’s contract (Amendment #1) to perform 6 additional rounds of monitoring to be done quarterly: March 2006, June 2006, September 2006, December 2006, March 2007 and June 2007.

In July 2007, additional funding was received from Ecology for an additional 8 quarters of groundwater monitoring (Amendment #3). These additional 8 quarters of monitoring are scheduled for September 2007, December 2007, March 2008, June 2008, September 2008, December 2008, March 2009 and June 2009.

SECTION 2

SAMPLING ACTIVITIES AND RESULTS

2.1 MONITORING WELL SAMPLING PROCEDURES

Sampling activities for Event 11 were conducted on June 4th through June 7th, 2007 by Weston Solutions, Inc, (Weston).

The monitoring wells in the vicinity of the FHC site are shown on Figure 2. A total of 33 wells in the vicinity of the site were sampled for metals in accordance with the *Long Term Monitoring Plan* (Weston 2004).

Well purging and sampling were performed according to sampling guidelines and Weston standard operating procedures. The wells were sampled with a peristaltic pump equipped with new polyethylene tubing deployed to mid-screen depth at each well. The wells were purged prior to sampling until monitored field parameters (turbidity, conductivity, pH, dissolved oxygen, ORP, and temperature) stabilized. The field parameter readings were recorded on field sampling forms.

Groundwater samples were analyzed for total analyte list (TAL) metals. In cases where groundwater turbidity was greater than 10 nephelometric turbidity units, samples were passed through a 0.45-micron filter in the field and submitted for dissolved TAL metals. One well (RA-MW-12A) had turbidity in excess of 10 NTU during this sampling event. Also during Event 11, both total and dissolved metals analyses were performed on samples collected from RA-MW-15B and RA-MW-16B at Ecology's request and from wells RA-MW-11A and B87-8 due to the presence of black particulate in the sample.

Selected samples were analyzed for total sulfur and sulfate to provide an assessment of the distribution of byproducts from the reducing agent used during ISRM wall installation.

Groundwater chromium concentrations are provided in Table 1. Measured field parameters are provided in Table 2.

2.2 ANALYTICAL RESULTS

2.2.1 Chromium

Chromium was detected in 29 of the 33 wells sampled. The detection limit for chromium during this round was 0.5 ug/L.

Total detected chromium concentrations in the "A" zone ranged from a maximum concentration of 107 ug/L in well RA-MW-12A to 0.9 ug/L in well W92-16A. All "A" zone wells except RA-MW-12A and B87-8 had total chromium concentrations less than or equal to 5 ug/L. Monitoring

well RA-MW-12A (which has generally had the highest concentration of chromium) had a dissolved chromium concentration of 4.6 ug/L. Filtered samples (in addition to unfiltered samples) have been routinely collected from well RA-MW-12A due to its high turbidity.

“A” zone chromium concentrations and plume contours are shown in Figure 3. Filtered sample data were used in preparing Figure 3 where available.

Total detected chromium concentrations in “B” zone groundwater ranged from a maximum of 41 ug/L (well RA-MW-15B) downgradient of the site to 0.7 ug/L in well RA-MW-14B. With the exception of wells RA-MW-15B and RA-MW-16B, all other “B” zone wells contained total chromium less than 4 ug/L. The filtered samples from wells RA-MW-15B and RA-MW-16B had chromium concentrations of 2.4 ug/L and 1.4 ug/L, respectively.

“B” zone chromium concentrations and plume contours are shown in Figure 4. Filtered sample data were used in preparing Figure 4 where available.

Figures showing the chromium concentration trends in groundwater over time are included in Appendix A. Data from wells sampled during Operational and Functional monitoring in November and December 2003 are included in these figures where available to assist in determining trends. Laboratory chromium data sheets for the June 2007 sampling event are provided in Appendix B.

Figures 3, 4, and those in Appendix A used filtered chromium values where available. In this June 2007 round of sampling, turbidity exceeded 10 NTU in one well, RA-MW-12A. Filtered samples were also collected from wells RA-MW-15B, RA-MW-16B, RA-MW-11A and B87-8. Filtered samples were collected from wells RA-MW-15B and RA-MW-16B at the request of Ecology to assist in determining the cause of the elevated total chromium concentrations in previous sampling events. Filtered samples were collected from RA-MW-11A and B87-8 due to the presence of black particulate in the sample.

2.2.2 Water Quality

Dissolved oxygen (DO) concentrations ranged from a low of 0 mg/L to a high of 9.8 mg/L. DO averaged 1.13 mg/L in samples collected within the ISRM Treatment Wall. The DO concentrations indicate the wall is still reductive which is necessary for treatment of hexavalent chromium. Samples of groundwater collected downgradient of the ISRM Treatment Wall had similar concentrations of DO as those within the treatment wall during this round of sampling. The downgradient DO concentrations were lower than usual.

pH ranged from 6.2 to 8.0. The highest pH during this round was located in well RA-MW-12A; this pH is not unusual since this well contains high concentrations of reagents.

The highest sulfur and sulfate concentrations were located within the treatment wall. Maximum sulfur and sulfate concentrations in groundwater were 304 mg/L and 795 mg/L, respectively. Concentrations of sulfur and sulfate were significantly lower immediately downgradient of the wall.

2.3 GROUNDWATER FLOW DIRECTION AND ELEVATION

Groundwater surface elevations were determined using the known elevation of the top of each well casing and the depth to groundwater measured in each long term monitoring well. The depth to groundwater measurements were collected during late morning of 07 June 2007. The Columbia River elevation at the United State Geological Survey (USGS) gauging station 14144700 located at the nearby I-5 bridge was obtained for use in determining flow direction. The elevation of the river at 1200 hours on 07 June 2007 was 7.52 feet (corrected to NGVD 1929 by adding 1.82 feet to the measured river elevation). The river elevation information can be obtained from <http://waterdata.usgs.gov/wa/nwis/>.

Groundwater surface elevations for each well measured are shown in Table 4. The groundwater flow direction (as determined using groundwater surface elevations measured in each well within a period of 1.5 hours, excluding wells W85-3A and W85-3B which were blocked due to construction activities) is heading towards the FHC site. A horizontal gradient was calculated for 07 June 2007 with a result of 0.0003 ft/ft with a flow direction towards the Columbia River. The groundwater table during this period had a drop in elevation of 0.72 feet over a distance of approximately 2,400 feet.

Groundwater elevation and gradient information is graphically shown in Figure 5.

2.4 QUALITY ASSURANCE

Data quality was checked by running field duplicates. Laboratory duplicates and matrix spike analyses were performed by the lab. Table 5 shows the quality control results.

Field duplicates were run on both filtered and unfiltered samples during this sampling event. Filtered duplicate results had good correlation with original sample results (relative percent difference of 4.3%). The unfiltered duplicate results varied more widely with a relative percent difference of 30.4%. Less precision in the duplicate results for the unfiltered sample from well B87-8 is likely due to the variable quantity of black particulate present in the sample during collection.

2.5 INVESTIGATION-DERIVED WASTES

Investigation-derived waste (IDW) generated during the sampling event consisted of well purge water, used PPE, and disposable sampling supplies. During sampling, purge water was stored on site in 5-gallon buckets. At the completion of sampling, the water was transported to the City of Vancouver's operations center and disposed of in accordance with the disposal permit issued to Weston by the city. Approximately 62 gallons of water was disposed. Personnel protective equipment and other solid wastes were disposed of in a dumpster.

2.6 DISCUSSION AND CONCLUSIONS

Chromium concentrations in onsite “A” zone groundwater in and around the ISRM Treatment Wall were less than 5 ug/L (using dissolved chromium concentrations where available). Chromium concentrations in groundwater between the ISRM Treatment Wall and East 1st Street were also less than 5 ug/L. Chromium concentrations in well B87-8, located south of East 1st Street, were 9 ug/L. Concentrations of chromium in samples collected during this round of sampling were very similar to those collected in March 2007. In general, the chromium concentrations in groundwater on and downgradient of the site were relatively uniform during the June 2007 sampling event with almost all chromium concentration less than 5 ug/L.

The deeper “B” zone groundwater downgradient of the site contained chromium in concentrations similar to that in the “A” zone. Chromium concentrations in “B” zone groundwater on and downgradient of the site were almost all less than 3 ug/L.

Wells RA-MW-15B and RA-MW-16B have had anomalously elevated chromium concentrations in unfiltered samples beginning in May 2005. Small black particulate was also observed in samples collected from these wells in December 2005 and have typically appeared in samples collected since that time. Therefore, both unfiltered and filtered samples were collected from these wells during this sampling event regardless of turbidity. The unfiltered sample from well RA-MW-15B had a chromium concentration of 41 ug/L whereas the filtered sample had a chromium concentration of 2.4 ug/L. The unfiltered sample from well RA-MW-16B had a chromium concentration of 7.0 ug/L whereas the filtered sample had a chromium concentration of 1.4 ug/L. In this round of sampling, the dissolved chromium concentration in wells RA-MW-15B and RA-MW-16B were similar, however, well RA-MW-15B had a much higher concentration of total chromium compared to well RA-MW-16B.

Well RA-MW-16A located downgradient of the treatment wall had evidence that reagents had reached this well. This well had a faint sulfur smell and was light yellow-green in color.

Dissolved oxygen data collected from within the ISRM Treatment Wall indicates that an area of reducing conditions still exists implying the hexavalent chromium treatment zone is still active. Most locations within the treatment wall contain dissolved oxygen at concentrations less than 1.0 mg/L and negative oxygen reduction potential (ORP) implying reducing conditions are present.

Sulfur/sulfate concentrations within the ISRM Treatment Wall have fluctuated while sulfur/sulfate concentrations downgradient of the ISRM Treatment Wall have generally increased since February 2004. Sulfur/sulfate concentrations in well B87-8 and B85-4 located across East 1st Street (downgradient of the site) have increased by a factor of approximately 3 to 6 since February 2004. Sulfur and sulfate concentrations were less than 130 mg/L and 350 mg/L in most locations sampled during June. It was noted during June sampling that the sulfur and sulfate concentrations in Wells W85-6A and W85-7A located approximately 600 feet downgradient of the former Frontier Hardchrome Building had decreased back to their typical levels from the elevated concentrations noted during March 2007.

SECTION 3

ANALYTICAL METHODS AND DATA VALIDATION

3.1 ANALYTICAL METHODS REQUIREMENTS AND DATA VALIDATION

The laboratory data quality assurance review and validation of analytical results for 40 water samples has been completed. Samples were collected between 04 June 2007 and 07 June 2007 from the Frontier Hard Chrome site and were analyzed for dissolved and total recoverable chromium.

The quality assurance review was performed on the laboratory data sheets and the WDOE memorandum to ensure that the analytical results met data quality objectives for the project. All laboratory quality assurance results as applicable (e.g., holding times, blank sample analysis, matrix spike/duplicate analysis, laboratory control sample analysis) supplied to Weston for the analyses met acceptance criteria specified in the work plan (Weston 2004), with no exceptions noted.

Samples **RA-MW-15B**, **RA-MW-16B**, **RA-MW-11A**, **RA-MW-12A** and **B87-8** were collected both as total recoverable (unfiltered) and dissolved (field-filtered) fractions – with one fraction submitted for total recoverable chromium analysis and the other filtered at the time of collection and submitted for dissolved chromium analysis. Samples **B87-8** and **RA-MW-15B** were collected as a field duplicates for total recoverable and dissolved chromium analysis, respectively.

Data validation documentation is provided in Appendix C.

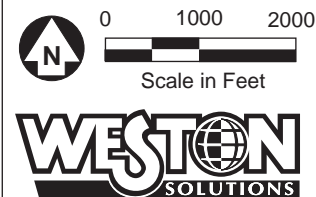
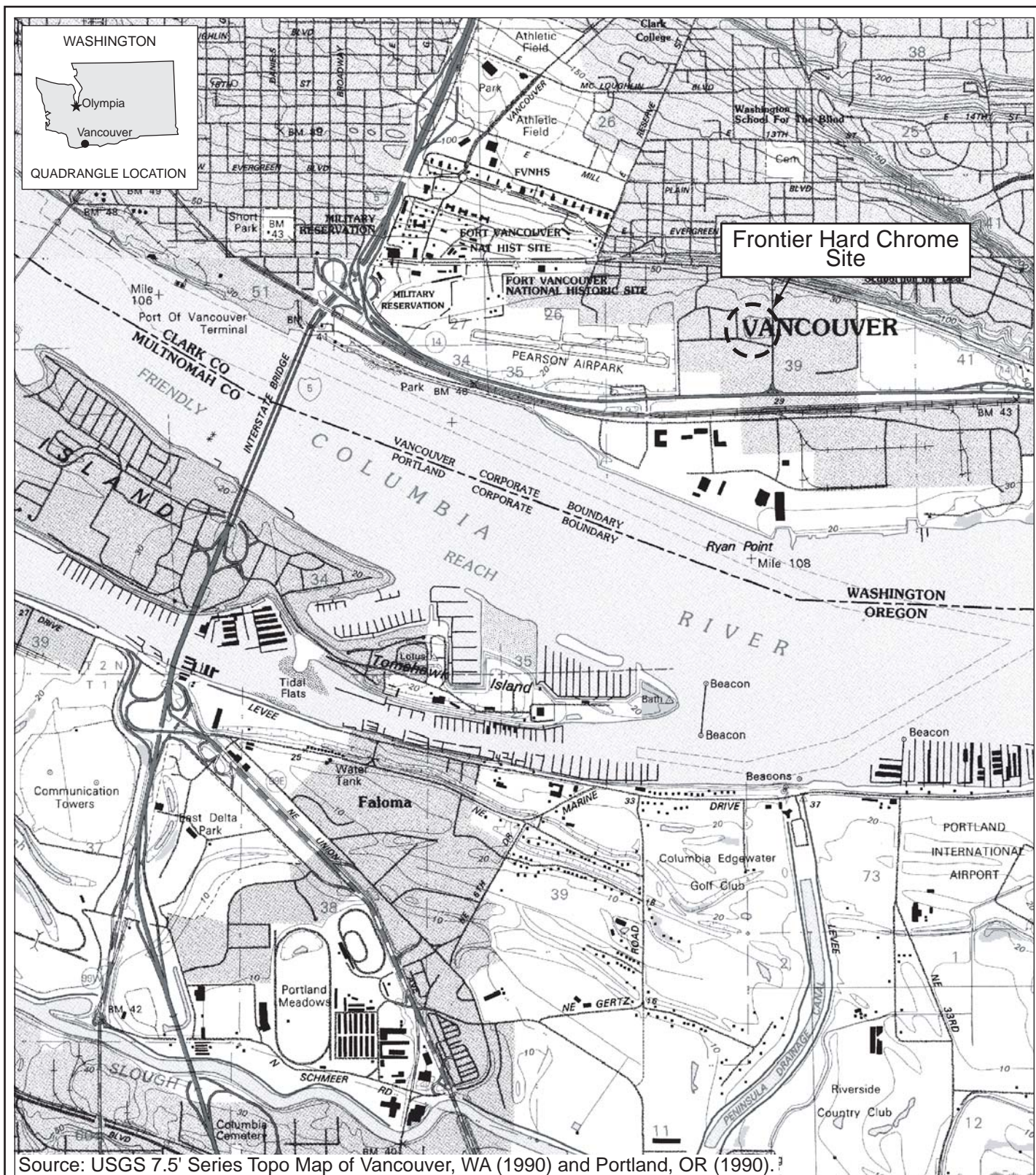
SECTION 4

REFERENCES

EPA (United States Environmental Protection Agency), 2003. Statement of Work for Long Term Response Action. Frontier Hard Chrome, Vancouver, WA. December 30th, 2003.

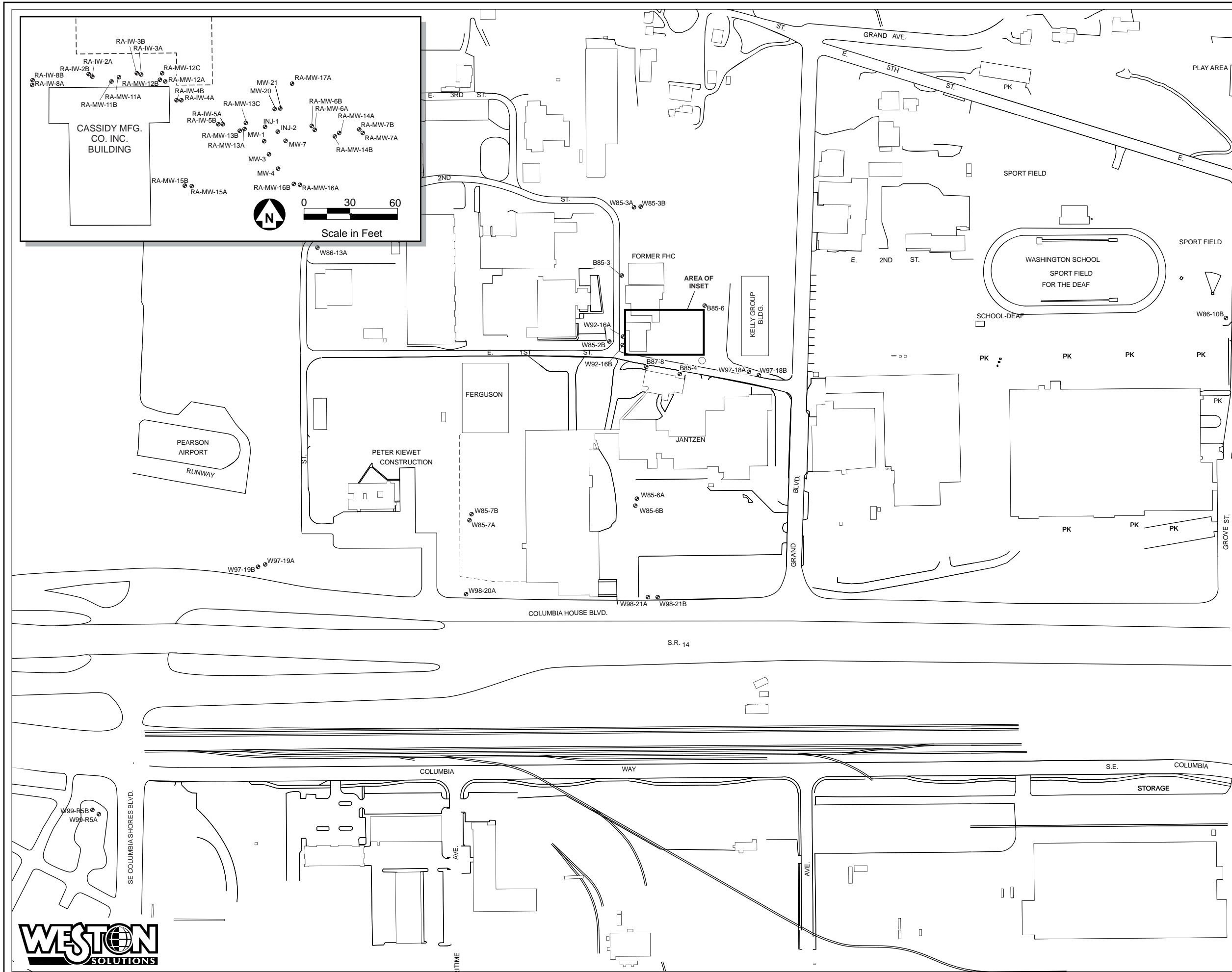
Weston (Weston Solutions, Inc.), 2004. Frontier Hard Chrome Long Term Monitoring Plan. Prepared for the U.S. Environmental Protection Agency, Region 10, Seattle, Washington. February.

FIGURES



Frontier Hard Chrome Vancouver, Washington Vicinity Map

Figure
1



LEGEND

W85-5B Monitoring Well Location and ID

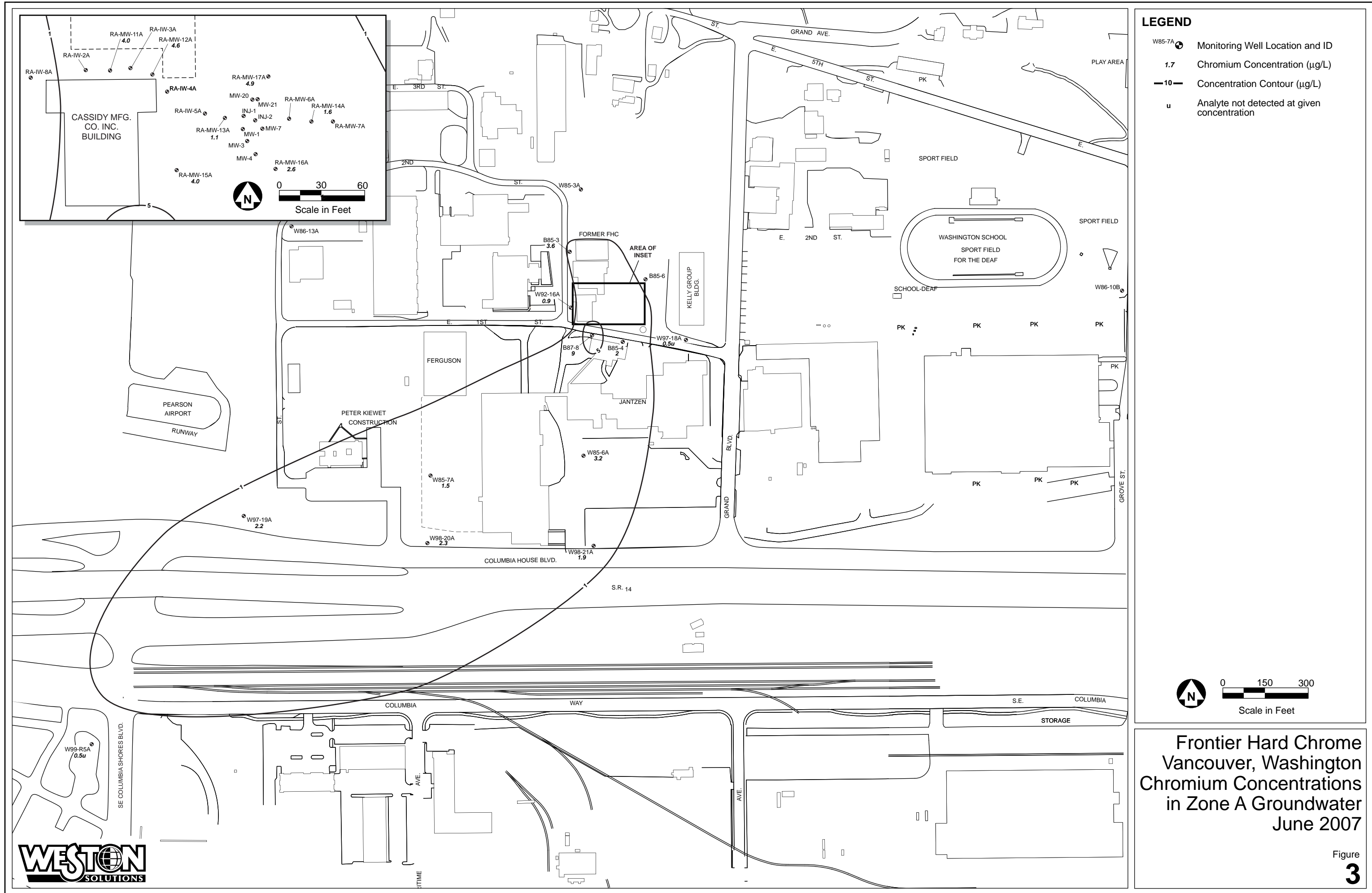
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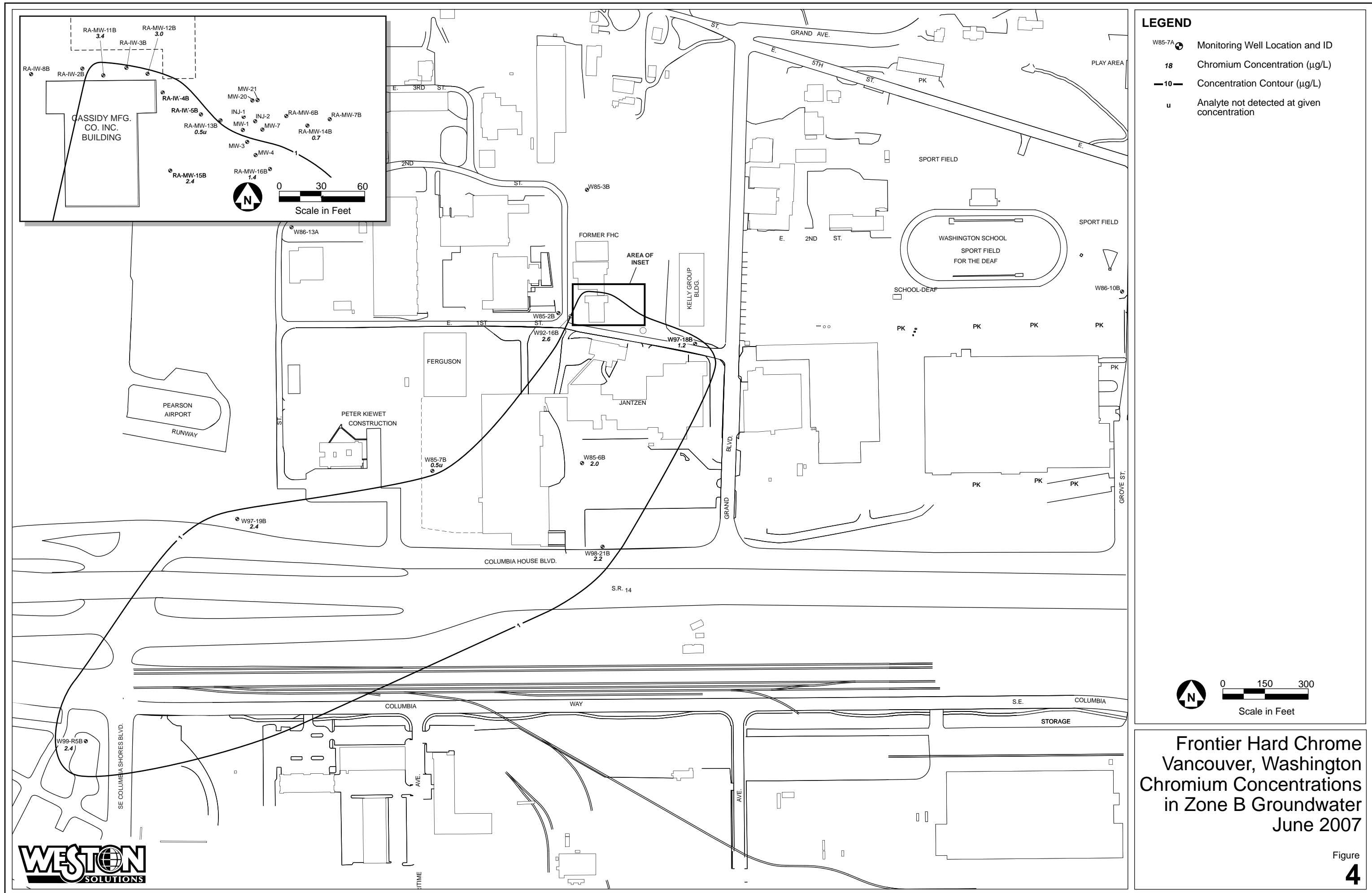
0 150 300

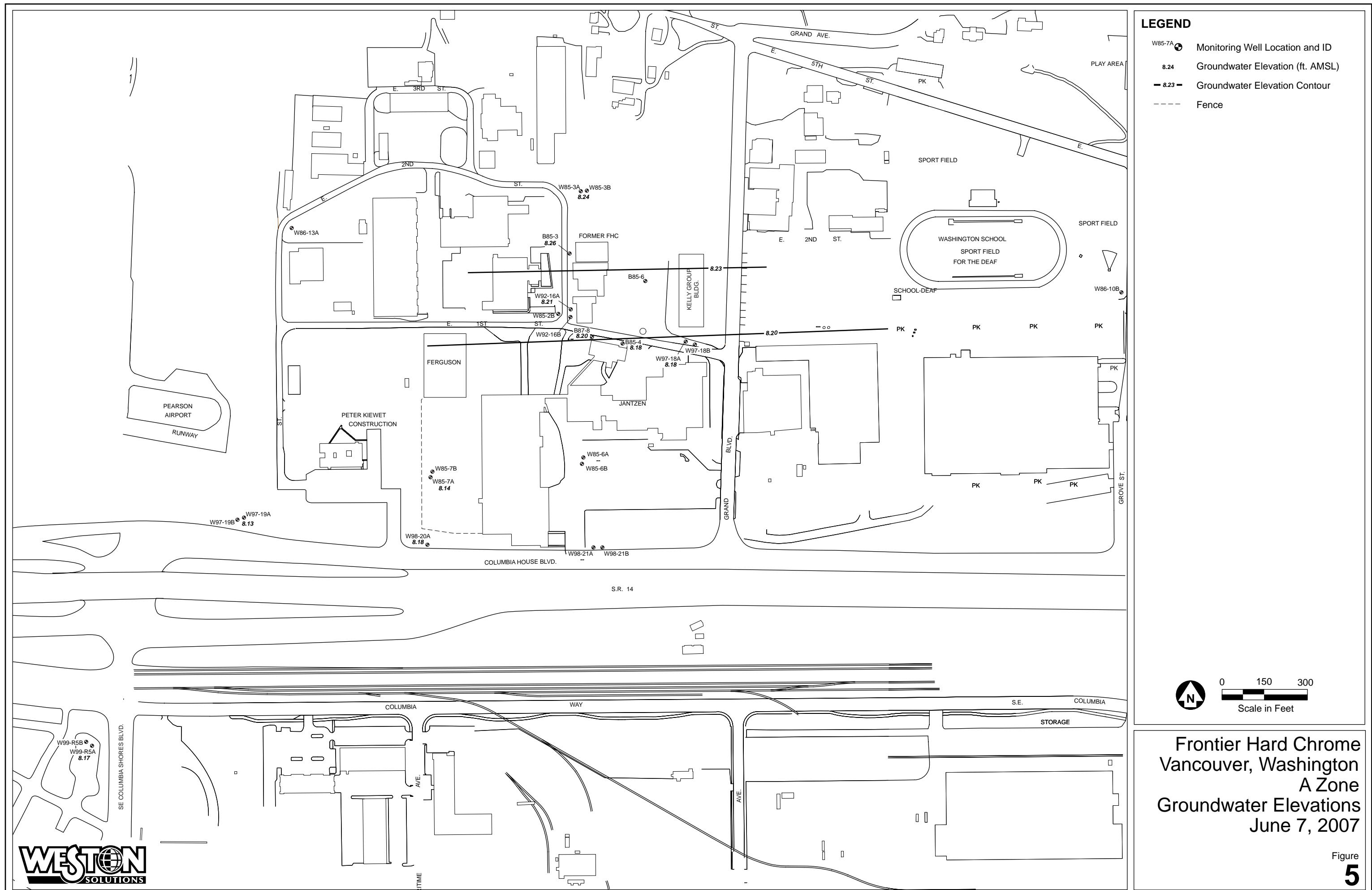
Scale in Feet

**Frontier Hard Chrome
Vancouver, Washington
Monitoring Well Locations**

Figure
2







TABLES

Table 1—Frontier Hard Chrome—Event 11 Chromium Results

Well Number	Concentration (ug/L)		Sample Observations
	Total	Dissolved	
RA-MW-12A	107	4.6	Purge water was a clear yellow-green with small black particulate. Strong sulfur smell. Color did not clear up.
RA-MW-12B	3.0	--	Light yellow-green color, strong sulfur smell.
RA-MW-12C	4.2	--	Clear, no odor.
RA-MW-11A	4.3	4.0	Clear, strong sulfur smell. Lots of black particulate in sample. Sample turns black after sitting.
RA-MW-11B	3.4	--	Purge water initially brown, lots of black particulate, strong sulfur smell.
RA-MW-13A	1.1	--	Light yellow-green. At start of purging - sample cloudy.
RA-MW-13B	0.5U	--	Cloudy at start, no odor.
RA-MW-13C	0.91	--	
RA-MW-17A	4.9	--	Clear, no odor at start. At end of purge, green floc in sample, algae?
RA-MW-14A	1.6	--	Clear, no odor, light yellow green.
RA-MW-14B	0.66	--	Cloudy white, no odor, water initially light yellow green.
RA-MW-16A	2.6	--	Clear, faint sulfur odor, light yellow green color.
RA-MW-16B	7.0	1.4	Clear, faint sulfur odor. Lots of black particulate at start, few at end.
RA-MW-15A	4.0	--	
RA-MW-15B	41	2.4	Cloudy at start of purging, no odor.
B87-8	131	9.2	Small black particulate in sample. No color or odor.
B85-3	3.6	--	At start, cloudy white, no odor. At end of purge, light yellow green and faint sulfur odor.
W92-16A	0.94	--	White particulate at start of purge. None at end.
W92-16B	2.6	--	
B85-4	2.4	--	Cloudy white at start, clear at end of purging. No odor.
W97-18A	0.5U	--	
W97-18B	1.2	--	
W85-7A	1.5	--	
W85-7B	0.5U	--	
W97-19A	2.2	--	Cloudy white at start of purging.
W97-19B	2.4	--	
W98-20A	2.3	--	
W99-R5A	0.5U	--	
W99-R5B	2.4	--	
W98-21A	1.9	--	
W98-21B	2.2	--	
W85-6A	3.2	--	
W85-6B	2.0	--	

-- denotes no sample collected

U: denotes analyte was not detected

J: denotes estimate.

Table 2—Frontier Hard Chrome—Event 11 Monitoring Field Parameters¹

Well Number	Temp C	Spec. Cond. (mS/cm)	DO (mg/L)	pH	ORP (mV)	Sulfur² (mg/L)	Sulfate² (mg/L)	Turbidity (NTU)
RA-MW-12A	13.9	1.11	0	7.97	-374			55
RA-MW-12B	14.1	0.89	9.82	7.55	-363			1.1
RA-MW-12C	14.1	0.49	0.40	7.79	-129			1.9
RA-MW-11A	14.0	1.22	0.13	6.68	-263	304	795	0.6
RA-MW-11B	14.1	0.77	0.81	6.94	-287			0.7
RA-MW-13A	14.3	1.23	0.24	6.95	-144	130	331	6.3
RA-MW-13B	14.2	0.50	0.14	7.43	-166			2.1
RA-MW-13C	14.0	0.51	0.46	7.53	-143			2.3
RA-MW-17A	14.1	1.03	0.14	6.47	-79			2.7
RA-MW-14A	13.0	0.74	0.21	6.62	-154	117	283	1.6
RA-MW-14B	13.8	0.68	0.13	6.89	-129			7.7
RA-MW-16A	13.9	0.83	0.36	6.64	-109			1
RA-MW-16B	13.8	0.32	0.24	7.27	-112			0.3
RA-MW-15A	15.1	1.06	0.19	6.5	-58			0.5
RA-MW-15B	14.9	0.49	0.15	6.84	-15			3.4
B87-8	14.3	0.19	7.00	6.89	87	43	120	0.9
B85-3	13.6	0.68	0.24	6.66	-66			4
W92-16A	14.5	0.47	0.32	6.44	100			1.8
W92-16B	14.4	0.25	4.16	7.51	60			0.6
B85-4	14.4	0.60	0.27	6.53	90	75	195	2.1
W97-18A	12.5	0.10	0.67	6.23	135			0.6
W97-18B	13.6	0.17	4.72	6.68	118			0.7
W85-7A	13.4	0.11	3.29	6.40	160	4	10	0.4
W85-7B	13.4	0.02	8.79	6.30	161			1.1
W97-19A	14.1	0.19	3.74	6.57	156			1.8
W97-19B	14.4	0.19	2.83	6.72	153			1.9
W98-20A	13.6	0.16	3.03	6.19	166			1.4
W99-R5A	15.5	0.21	4.53	6.18	81	5	14	0.4
W99-R5B	15.0	0.21	3.49	6.54	90			0.7
W98-21A	14.0	0.27	0.80	6.34	165			0.9
W98-21B	14.2	0.21	3.52	6.46	161			0.2
W85-6A	13.6	0.27	0.51	6.50	168	19	51	0.2
W85-6B	13.8	0.19	4.96	6.76	161			1.8

¹Parameters measured after readings stabilized.

²Sulfur and sulfate data obtained from laboratory analyses.

*: Denotes sulfur interference with dissolved oxygen readings.

Table 3—Comparison of Conventional Parameters

Well #	Temp (C)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A	14.9	15.9	17.9	15.2	14.9	14.6	14.3	14.9	13.9	14.0	13.9
RA-MW-12B	14.4	16.6	16.7	15.6	14.3	14.9	14.4	14.5	13.4	14.3	14.1
RA-MW-12C	14.4	16.5	16.6	15.1	14.2	14.3	14.2	14.2	13.1	13.3	14.1
RA-MW-11A	15.7	16.5	17.4	15.7	15.0	15.1	15.1	14.9	13.7	13.8	14.0
RA-MW-11B	14.9	16.3	17	15.6	14.9	14.7	14.7	14.7	13.4	13.6	14.1
RA-MW-13A	15	14.6	15.73	14.9	14.5	14.3	13.7	14.1	12.8	13.8	14.3
RA-MW-13B	14.8	14.7	15.4	14.9	14.2	14.3	14.1	14.2	13.0	13.9	14.2
RA-MW-13C	14.2	15	14.9	14.5	14.3	13.8	13.8	14.1	12.4	13.9	14.0
RA-MW-17A	14.3	15.3	16.7	15.1	14.5	13.7	--	13.9	13.4	13.1	14.1
RA-MW-14A	13.9	14.3	15.3	14.6	14.7	10.8	--	13.6	12.7	10.8	13.0
RA-MW-14B	14	14.9	15.5	14.5	14.1	12.3	--	14.0	12.8	11.3	13.8
RA-MW-16A	14.3	14.9	16	14.9	15.1	13.3	13.4	14.8	13.8	14.0	13.9
RA-MW-16B	14.3	14.6	16	14.7	13.9	13.7	13.8	15.2	13.4	14.3	13.8
RA-MW-15A	14.3	14.5	15	15	14.7	14.8	14.7	15.1	14.7	15.3	15.1
RA-MW-15B	13.9	14.4	15.4	14.7	14.1	14.0	14.5	17.2	14.1	14.8	14.9
B87-8	14.5	14.7	15.8	15.2	14.7	14.4	14.5	14.4	13.8	14.4	14.3
B85-3	14.6	14.8	15.2	15.8	14.4	14.1	13.6	14.6	12.4	12.5	13.6
W92-16A	14.2	15.6	16.1	15.3	14.0	13.8	14.1	15.5	13.6	13.3	14.5
W92-16B	14.1	14.7	16.2	15.2	13.7	13.7	13.8	15.4	13.1	13.3	14.4
B85-4	14.1	14.4	15.1	14.4	13.9	13.5	14.3	14.5	13.8	14.6	14.4
W97-18A	11.3	11.0	15.0	12.7	13.9	12.0	--	13.8	13.0	11.6	12.5
W97-18B	11.4	12.4	14.4	13.5	13.0	10.7	--	13.8	12.6	12.0	13.6
W85-7A	11.4	12.6	14.9	13.9	14.5	12.3	13.7	15.9	13.4	12.7	13.4
W85-7B	12.1	13.0	14.5	13.6	14.1	12.8	13.4	14.4	13.0	13.0	13.4
W97-19A	12.5	13.3	16	14.3	13.8	12.9	--	15.3	13.9	13.8	14.1
W97-19B	12.7	13.3	15.9	15.3	13.3	12.4	--	15.2	13.0	14.2	14.4
W98-20A	13.8	12.5	15.4	14.3	14.3	13.1	--	15.3	14.0	13.1	13.6
W99-R5A	14.2	14.9	15.7	14.8	14.8	14.7	15.1	--	13.9	13.9	15.5
W99-R5B	13.9	14.4	15.6	14.4	14.5	13.9	14.7	--	13.5	13.5	15.0
W98-21A	13.1	14.3	14.2	13.8	13.9	13.8	13.7	15.0	13.7	13.7	14.0
W98-21B	13.1	13.6	14	13.8	13.7	13.0	13.7	14.7	13.4	13.5	14.2
W85-6A	14.1	14.1	15.5	14	--	--	13.7	15.3	13.9	13.2	13.6
W85-6B	13.6	13.8	16.3	13.7	--	--	13.8	15.1	13.1	13.1	13.8

Table 3—Comparison of Conventional Parameters (continued)

Well #	Conductivity (mS/cm)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A	6.01	5.4	4	3.32	2.52	2.47	2.37	2.26	2.95	0.85	1.11
RA-MW-12B	2.25	1.19	1.52	2.56	2.47	1.34	1.39	1.19	2.12	1.12	0.89
RA-MW-12C	2.18	1.34	1.13	0.68	1.09	0.69	0.88	0.53	1.05	0.65	0.49
RA-MW-11A	1.67	1.89	2.02	1.48	1.82	2.01	1.46	1.7	2.21	1.75	1.22
RA-MW-11B	1.49	2.08	2.02	1.72	2.25	1.17	0.94	1.1	1.50	1.21	0.77
RA-MW-13A	5.21	2.42	3.29	2.83	2.49	2.17	1.66	1.13	2.33	1.34	1.23
RA-MW-13B	3.73	1.38	2.15	2.41	2.16	0.81	0.82	0.5	2.22	1.23	0.50
RA-MW-13C	3.07	1.82	1.41	1.28	0.71	0.79	0.82	0.57	1.36	0.93	0.51
RA-MW-17A	1.8	1.8	1.8	1.39	1.18	1.3	--	1.18	1.30	1.04	1.03
RA-MW-14A	1.43	1.71	1.96	1.08	0.88	0.87	--	0.92	0.77	0.87	0.74
RA-MW-14B	1.56	1.21	0.98	1.08	1	0.78	--	0.69	0.89	0.87	0.68
RA-MW-16A	2.95	1.46	2	1.7	1.07	1.04	1.01	0.8	1.13	1.02	0.83
RA-MW-16B	2.42	1.19	1.4	1.81	0.92	0.67	0.51	0.43	1.34	1.05	0.32
RA-MW-15A	1.88	1.04	1.08	1.3	1.42	1.53	1.44	1.27	1.74	1.1	1.06
RA-MW-15B	0.47	0.86	0.68	0.64	0.91	0.92	0.8	0.46	1.60	1.16	0.49
B87-8	0.26	0.55	0.36	0.29	0.24	0.38	0.27	0.36	0.44	0.39	0.19
B85-3	0.99	0.90	0.98	0.81	0.54	0.74	0.64	0.72	0.97	0.84	0.68
W92-16A	0.33	0.25	0.27	0.23	0.24	0.28	0.28	0.37	0.47	0.57	0.47
W92-16B	1.17	1.37	0.95	0.66	0.09	0.34	0.42	0.32	0.61	0.57	0.25
B85-4	0.41	1.17	0.51	0.71	0.28	0.74	0.33	0.56	0.92	739	0.60
W97-18A	0.11	0.09	0.11	0.08	0.1	0.19	--	0.15	0.16	0.16	0.10
W97-18B	0.26	0.24	0.27	0.22	0.19	0.19	--	0.19	0.28	0.23	0.17
W85-7A	0.13	0.14	0.21	0.12	0.11	0.1	0.16	0.16	0.13	219	0.11
W85-7B	0.28	0.31	0.32	0.01	0.01	0.01	0.02	0.01	0.03	0.01	0.02
W97-19A	0.25	0.26	0.28	0.23	0.23	0.19	--	0.21	0.26	0.24	0.19
W97-19B	0.26	0.26	0.29	0.22	0.06	0.19	--	0.2	0.28	0.23	0.19
W98-20A	0.16	0.15	0.23	0.12	0.12	0.13	--	0.18	0.25	0.18	0.16
W99-R5A	0.24	0.25	0.24	0.22	0.21	0.2	0.2	--	0.27	0.22	0.21
W99-R5B	0.26	0.26	0.27	0.23	0.22	0.22	0.22	--	0.28	0.24	0.21
W98-21A	0.16	0.23	0.29	0.45	0.19	0.19	0.22	0.25	0.29	0.29	0.27
W98-21B	0.24	0.27	0.27	0.25	0.18	0.22	0.21	0.24	0.32	0.31	0.21
W85-6A	0.11	0.33	0.34	299	--	--	0.23	0.24	0.24	0.36	0.27
W85-6B	0.31	0.41	0.33	0.26	--	--	0.1	0.11	0.17	0.24	0.19

Table 3—Comparison of Conventional Parameters (continued)

Well #	DO (mg/L)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A	0.24	0.09	0.2	0.13	0.04	0	52.7*	17*	56.41*	0	0
RA-MW-12B	0.27	0.07	0.27	0.07	0.05	1.26	45.1*	12.16	73.22*	0	9.82
RA-MW-12C	0.2	0.14	0.42	0.25	0.07	1.1	5.16	4.93	3.33	0.01	0.40
RA-MW-11A	0.32	0.10	0.66	6.69	0.16	0	24.2*	22.5*	1.8	0	0.13
RA-MW-11B	0.19	0.15	0.5	0.14	0.1	0.19	26.6*	4.44	2.5	0	0.81
RA-MW-13A	1.63	0.17	1.13	0.53	0.11	0.38	0.27	1	0	0.04	0.24
RA-MW-13B	0.73	0.16	0.73	0.51	0.21	0.45	0.35	0.49	0	0.09	0.14
RA-MW-13C	0.22	0.15	0.43	1.4	2.98	0.96	0.41	0.8	0	0.06	0.46
RA-MW-17A	0.6	0.19	1.99	0.6	0.2	3.69	--	0.74	0.35	0.11	0.14
RA-MW-14A	0.89	0.22	5.96	0.51	0.22	6.74	--	0.88	1.75	0.6	0.21
RA-MW-14B	1.08	0.10	2.77	0.42	0.12	2.58	--	0.52	1.73	0.9	0.13
RA-MW-16A	0.73	0.27	1.39	1.6	0.11	5.4	0.54	0.49	0.31	0.05	0.36
RA-MW-16B	0.75	0.15	0.86	0.75	0.33	1.85	0.27	0.27	0.21	0.05	0.24
RA-MW-15A	0.33	0.21	1.53	0.47	0.15	8.34	0.47	2.89	0.29	0.04	0.19
RA-MW-15B	0.22	0.10	0.74	0.44	0.18	0.79	0.3	1.25	0.30	0.06	0.15
B87-8	0.13	1.03	1.06	0.35	0.28	0.53	0.37	0.52	0.25	0.01	7.00
B85-3	1.11	0.16	1.57	4.5	0.12	2.97	0.22	1.04	0.80	0.02	0.24
W92-16A	0.98	0.13	2.49	3.1	0.28	0.15	0.45	0.32	0.33	0.13	0.32
W92-16B	0.14	0.53	1.97	3.4	5.4	1.02	0.54	2.12	0.23	0.8	4.16
B85-4	0.65	1.37	1.5	0.33	0.2	0.22	0.52	1.61	0.30	0.03	0.27
W97-18A	1.27	0.74	1.09	0.5	1.1	4	--	1.45	0.90	0.90	0.67
W97-18B	2.01	5.56	4.52	4.9	2	1.17	--	4.25	4.59	1.09	4.72
W85-7A	4.05	3.17	2.18	4.3	2.2	6.7	5.89	3.09	2.39	0.18	3.29
W85-7B	2.78	5.11	6.1	8.7	4	10.3	10.96	3.77	0.06	0.1	8.79
W97-19A	4.72	1.79	22.73	4.6	0.97	3.51	--	3.5	9.37	1	3.74
W97-19B	1.81	1.31	2.6	2.6	1.1	2.99	--	3.43	4.13	0.52	2.83
W98-20A	4.92	3.76	5.5	5	3.2	5.1	--	3.63	9.14	5.7	3.03
W99-R5A	4.72	4.26	5.6	5.3	3.3	1.83	5.1	--	6.26	4.90	4.53
W99-R5B	3.97	2.71	4.7	5.1	1.9	2.03	4.2	--	4.90	3.40	3.49
W98-21A	1.29	1.49	3.03	13.3	1.2	1.05	3.26	2.59	4.97	0.07	0.80
W98-21B	1.24	3.29	2.82	17.7	3.9	1.08	3.37	2.42	4.90	0.02	3.52
W85-6A	4.92	0.43	0.85	4.9			1.86	2.06	2.63	0.09	0.51
W85-6B	3.46	6.13	6.54	5.5			7.87	3.83	5.15	0.05	4.96

*: Denotes sulfur/sulfate interference with dissolved oxygen readings.

Table 3—Comparison of Conventional Parameters (continued)

Well #	pH										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A	8.86	8.73	8.86	8.98	8.41	8.19	8.46	8.54	7.59	7.86	7.97
RA-MW-12B	7.77	7.83	7.92	8.3	8.68	8.16	7.76	7.83	8.06	7.94	7.55
RA-MW-12C	8.13	7.92	8.09	7.95	8.14	7.89	7.92	7.9	7.74	7.8	7.79
RA-MW-11A	7.51	7.53	7	6.52	6.64	6.64	6.46	6.48	6.43	6.69	6.68
RA-MW-11B	7.66	7.9	7.2	6.7	6.73	7	6.69	6.85	6.86	7.01	6.94
RA-MW-13A	7.15	7.15	7.03	6.7	6.86	6.82	6.82	6.96	7.02	7.08	6.95
RA-MW-13B	7.23	7.56	7.3	6.86	6.99	7.15	6.95	7.52	7.04	7.06	7.43
RA-MW-13C	7.36	7.35	7.44	7.33	7.48	7.25	7.25	7.45	7.45	7.44	7.53
RA-MW-17A	6.55	6.43	6.61	6.2	6.39	6.5	--	6.42	6.66	6.59	6.47
RA-MW-14A	6.64	6.81	6.99	6.5	6.6	6.6	--	5.98	6.76	6.65	6.62
RA-MW-14B	6.9	7.14	7.33	6.75	6.78	6.87	--	6.4	6.98	6.82	6.89
RA-MW-16A	6.61	6.61	6.75	6.42	6.44	6.62	6.44	5.96	6.68	6.71	6.64
RA-MW-16B	6.42	7.12	7.09	6.31	7.12	7.06	6.85	6.09	6.62	6.78	7.27
RA-MW-15A	6.35	6.37	6.74	6.2	6.3	6.47	6.28	6.09	6.53	6.61	6.5
RA-MW-15B	6.35	6.83	7.18	6.39	6.39	6.51	6.26	6.61	6.39	6.48	6.84
B87-8	6.55	6.31	6.73	6.54	6.68	6.57	6.35	6.61	6.71	6.71	6.89
B85-3	6.49	6.68	6.91	6.39	6.7	6.64	6.42	6.33	6.73	6.68	6.66
W92-16A	6.42	6.42	6.72	6.6	6.56	6.6	6.67	5.87	6.59	6.52	6.44
W92-16B	7.51	7.58	7.63	7.59	6.88	7.54	7.38	6.35	7.46	7.62	7.51
B85-4	6.14	6.26	6.53	6.22	6.51	6.49	6.21	6.28	6.47	6.53	6.53
W97-18A	5.83	5.96	6.19	6.17	6.78	6.57	--	5.08	6.29	6.32	6.23
W97-18B	6.57	6.35	6.67	6.41	6.6	6.16	--	6.25	6.55	6.61	6.68
W85-7A	6.24	6.04	6.26	6.2	6.3	6.35	6.24	5.69	6.45	6.33	6.40
W85-7B	6.63	6.51	6.71	5.91	6.18	6.14	6.37	5.39	6.57	6.23	6.30
W97-19A	6.35	6.24	6.28	6.35	6.59	6.41	--	5.53	6.55	6.58	6.57
W97-19B	6.68	6.49	6.3	6.47	6.68	6.68	--	5.89	6.83	6.76	6.72
W98-20A	6.01	5.91	6.32	5.97	6.29	6.18	--	4.9	6.26	6.41	6.19
W99-R5A	6.03	5.98	6.28	6.21	6.22	6.28	6.23	--	6.40	6.30	6.18
W99-R5B	6.2	6.23	6.55	6.33	6.63	6.55	6.26	--	6.62	6.63	6.54
W98-21A	5.92	6.07	6.68	6.18	6.3	6.25	6.11	4.8	6.16	6.43	6.34
W98-21B	6.04	6.07	6.9	6.24	6.64	6.36	6.07	5.55	6.38	6.39	6.46
W85-6A	6.23	6.22	6.4	6.36	--	--	6.25	5.47	6.63	6.47	6.50
W85-6B	6.4	6.42	6.68	6.62	--		8.93	7.16	8.05	6.83	6.76

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Table 3—Comparison of Conventional Parameters (continued)

Well #	ORP (mV)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A	-468	-466	-430	-417	-403	-393	-363	-311	-373	-324	-374
RA-MW-12B	-363	-321	-315	-415	-414	-345	-327	-355	-374	-313	-363
RA-MW-12C	-282	-179	-154	-239	-314	-234	-191	-164	-217	-137	-129
RA-MW-11A	-384	-391	-316	-110	-241	-246	-216	-294	-671	-260	-263
RA-MW-11B	-394	-393	-332	-296	-289	-301	-278	-317	-303	-261	-287
RA-MW-13A	-155	-102	-97	-94	-204	-176	-93	-153	-121	-125	-144
RA-MW-13B	-129	-123	-104	-105	-125	-197	-85	-152	-125	-144	-166
RA-MW-13C	-136	-126	-116	-142	-33	-175	-112	-135	-137	-133	-143
RA-MW-17A	-91	-40	-7	-5	-27	-89	--	-106	-34	-128	-79
RA-MW-14A	-77	-41	-54	-75	-82	-136	--	-80	-64	-104	-154
RA-MW-14B	-112	-95	-102	-112	-134	-133	--	-98	-144	-141	-129
RA-MW-16A	-94	-45	-58	-156	-103	-160	-93	-125	-125	-112	-109
RA-MW-16B	-57	-70	-60	-85	-130	-131	-66	-155	-113	-88	-112
RA-MW-15A	-47	4	39	10	-12	-137	-28	-52	-24	13	-58
RA-MW-15B	-5	28	15	17	-11	16	34	76	32	48	-15
B87-8	-8	31	17	199	2	73	86	160	167	170	87
B85-3	-7	-107	-37	-47	-93	-62	-43	-53	-59	-43	-66
W92-16A	1	-14	30	110	110	-32	61	129	127	76	100
W92-16B	-116	-61	-60	73	119	-103	30	253	113	71	60
B85-4	10	41	59	218	-26	75	86	179	161	182	90
W97-18A	32	57	67	103	58	137	--	317	192	119	135
W97-18B	57	63	60	188	83	152	--	233	187	123	118
W85-7A	68	83	57	197	116	113	127	246	131	186	160
W85-7B	59	73	66	215	132	146	167	259	141	187	161
W97-19A	71	94	72	218	69	149	--	311	96	71	156
W97-19B	56	86	56	52	76	142	--	295	88	74	153
W98-20A	52	116	84	219	116	171	--	366	143	91	166
W99-R5A	58	96	97	153	123	197	116	--	131	100	81
W99-R5B	58	78	74	201	92	204	111	--	122	92	90
W98-21A	28	69	79	182	113	160	114	484	157	-55	165
W98-21B	33	72	47	202	121	161	117	471	148	111	161
W85-6A	17	57	86	163	--	--	107	356	123	172	168
W85-6B	19	76	72	159	--	--	79	340	70	164	161

Table 3—Comparison of Conventional Parameters (continued)

Well #	Sulfur (mg/L)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A											
RA-MW-12B											
RA-MW-12C											
RA-MW-11A	286	296	304	285	460	448	322	402	342	311	304
RA-MW-11B											
RA-MW-13A	743	246	324	372	363	310	213	111	207	107	130
RA-MW-13B											
RA-MW-13C											
RA-MW-17A											
RA-MW-14A	189	228	214	136	122	158	124	140	72	107	117
RA-MW-14B											
RA-MW-16A											
RA-MW-16B											
RA-MW-15A											
RA-MW-15B											
B87-8	9	52	22	17	23	48	21	42	31	34	43
B85-3											
W92-16A											
W92-16B											
B85-4	23	150	31	87	20	103	21	59	67	59	75
W97-18A											
W97-18B											
W85-7A	3	4	5	4	4	3	5	6	3	10	4
W85-7B											
W97-19A											
W97-19B											
W98-20A											
W99-R5A	5	6	4	5	6	7	6	5	5	5	5
W99-R5B											
W98-21A					8	10					
W98-21B											
W85-6A		15	14	18	--	--	12	15	7	26	19
W85-6B											

Table 3—Comparison of Conventional Parameters (continued)

Well #	Sulfate (mg/L)										
	Feb-04	Apr-04	Aug-04	May-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07
RA-MW-12A											
RA-MW-12B											
RA-MW-12C											
RA-MW-11A	620	751	1040	736	1200	3040	993	1170	1120	954	795
RA-MW-11B											
RA-MW-13A	1960	712	1056	985	971	1980	682	323	657	362	331
RA-MW-13B											
RA-MW-13C											
RA-MW-17A											
RA-MW-14A	477	635	697	357	351	429	396	400	225	358	283
RA-MW-14B											
RA-MW-16A											
RA-MW-16B											
RA-MW-15A											
RA-MW-15B											
B87-8	21	137	73	170	63	125	74	117	98	113	120
B85-3											
W92-16A											
W92-16B											
B85-4	58	410	104	222	50	253	75	169	212	201	195
W97-18A											
W97-18B											
W85-7A	6	9	15	13	8	8	18	16	7	30	10
W85-7B											
W97-19A											
W97-19B											
W98-20A											
W99-R5A	12	12	13	15	13	15	18	14	14	16	14
W99-R5B											
W98-21A					19	25					
W98-21B											
W85-6A	5	36	44	44	--	--	35	41	21	85	51
W85-6B											

Table 4—Frontier Hard Chrome—Event 11 Ground Water Elevations 7 June 2007

Well No.	Time	Casing Elevation (feet)	Depth to Water (feet)	Water level Elevation (AMSL)
W85-3A	1418	26.40	18.16	8.24
W85-3B	1427	26.77	18.51	8.26
W97-18A	1145	25.44	17.26	8.18
W97-18B	1146	25.36	17.17	8.19
B85-4	1141	25.38	17.2	8.18
B87-8	1137	25.95	17.75	8.20
W92-16B	1123	25.51	17.32	8.19
W92-16A	1120	25.62	17.41	8.21
B85-3	1108	24.90	16.64	8.26
W85-7A	1130	22.83	14.69	8.14
W85-7B	1131	23.00	14.86	8.14
W97-19A	1202	22.45	14.32	8.13
W97-19B	1203	21.72	13.66	8.06
W98-20A	1157	23.57	15.39	8.18
W85-6A	--	25.87	--	--
W85-6B	--	26.13	--	--
W98-21B	--	25.50	--	--
W98-21A	--	25.28	--	--
W99-R5A	1220	32.26	24.09	8.17
W99-R5B	1222	32.33	24.16	8.17
USGS 14144700 (Stage height of the Columbia River corrected to NGVD 1929)				7.52

¹Two different elevation datum's have been used at Frontier Hard Chrome. Weston (12/03) Long-Term Monitoring plan has applied a correction factor (+3.76 feet) using the City of Vancouver's benchmark #108 located near FHC site.

-- Could not measure water level elevation because construction contractor changed lock on access gate.

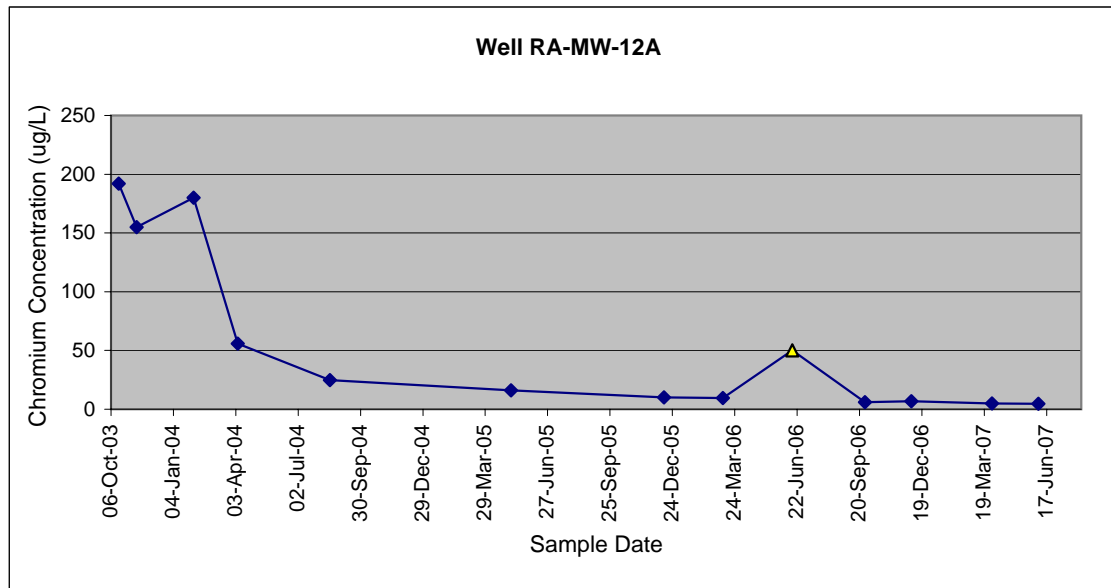
Table 5—Quality Assurance Sample Results - Chromium

Well #	Sample Type	Original Sample Chromium Concentration (mg/L)	Duplicate Sample Chromium Concentration (mg/L)	Relative Percent Difference
B87-8 (total)	Field Duplicate	131	96.4	30.4%
RA-MW-15B (filtered)	Field Duplicate	2.4	2.3	4.3%

APPENDIX A
GROUNDWATER CHROMIUM CONCENTRATION TRENDS

Well RA-MW-12A

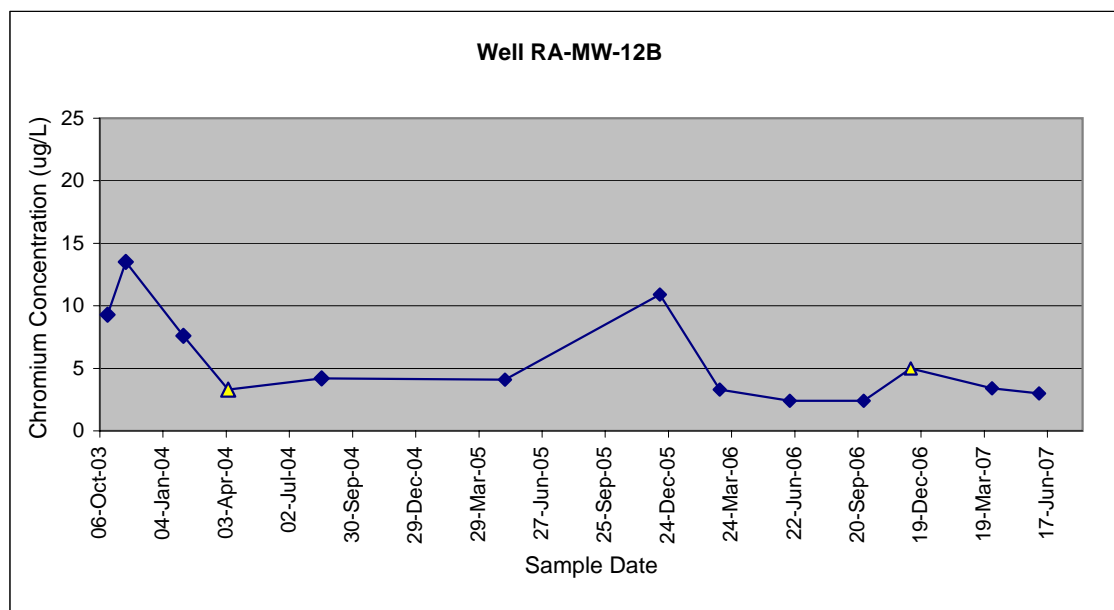
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2524	Water	17-Oct-03	CHROMIUM	192	UG/L		RA-MW-12A	Dissolved	>10
MJ27F5	Water	12-Nov-03	CHROMIUM	155	UG/L		RA-MW-12A	Dissolved	>10
MJ2AF0	Water	02-Feb-04	CHROMIUM	180	UG/L		RA-MW-12A	Total	7
MJ2BH9	Water	06-Apr-04	CHROMIUM	55.8	UG/L		RA-MW-12A	Dissolved	17
MJ4725	Water	17-Aug-04	CHROMIUM	24.9	UG/L		RA-MW-12A	Dissolved	12
184253	Water	5-May-05	CHROMIUM	16	UG/L		RA-MW-12A	Dissolved	32
05504282	Water	12-Dec-05	CHROMIUM	10.2	UG/L		RA-MW-12A	Dissolved	86
104243	Water	7-Mar-06	CHROMIUM	9.6	UG/L		RA-MW-12A	Dissolved	60
244313	Water	15-Jun-06	CHROMIUM	50	UG/L	U	RA-MW-12A	Dissolved	47
394218	Water	28-Sep-06	CHROMIUM	6.0	UG/L		RA-MW-12A	Dissolved	80
494110	Water	4-Dec-06	CHROMIUM	6.8	UG/L		RA-MW-12A	Dissolved	12
134255	Water	30-Mar-07	CHROMIUM	5.0	UG/L		RA-MW-12A	Dissolved	85
234081	Water	5-Jun-07	CHROMIUM	4.6	UG/L		RA-MW-12A	Dissolved	55



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

Well RA-MW-12B

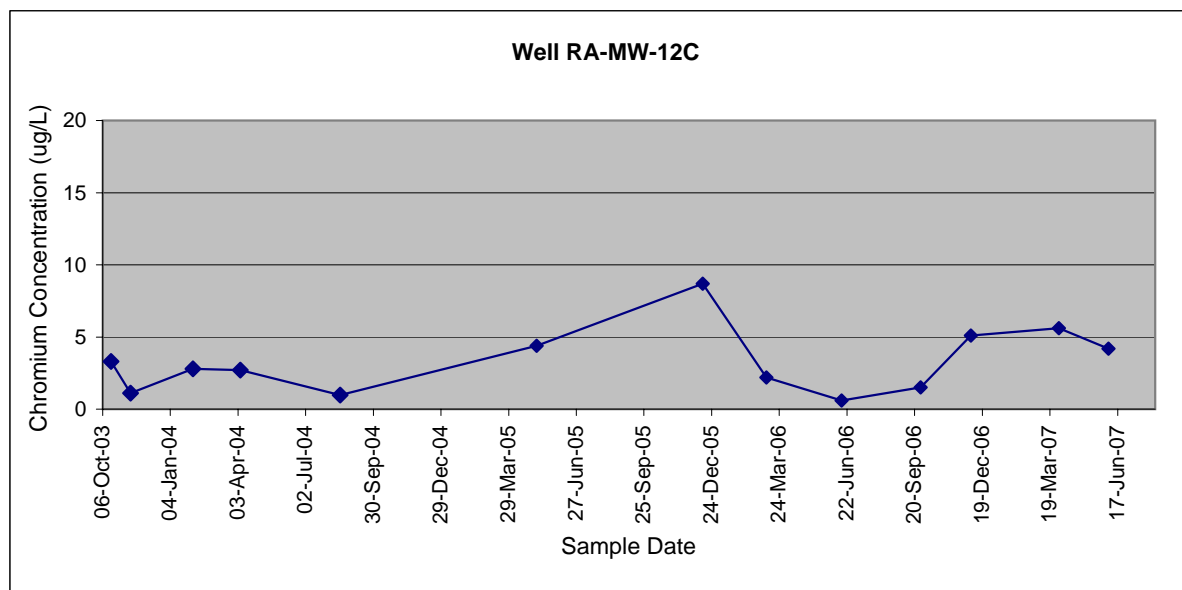
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2526	Water	17-Oct-03	CHROMIUM	9.3	UG/L	BJ	RA-MW-12B	Dissolved	>10
MJ27F7	Water	12-Nov-03	CHROMIUM	13.5	UG/L		RA-MW-12B	Dissolved	>10
MJ2AF1	Water	02-Feb-04	CHROMIUM	7.6	UG/L	J	RA-MW-12B	Total	6
MJ2BJ0	Water	06-Apr-04	CHROMIUM	3.3	UG/L	U	RA-MW-12B	Total	0
MJ4726	Water	17-Aug-04	CHROMIUM	4.2	UG/L	J	RA-MW-12B	Total	2
184254	Water	5-May-05	CHROMIUM	4.1	UG/L		RA-MW-12B	Total	4.5
05504283	Water	12-Dec-05	CHROMIUM	10.9	UG/L		RA-MW-12B	Total	8
104242	Water	7-Mar-06	CHROMIUM	3.3	UG/L		RA-MW-12B	Total	1.7
244315	Water	15-Jun-06	CHROMIUM	2.4	UG/L		RA-MW-12B	Total	14
394216	Water	28-Sep-06	CHROMIUM	2.4	UG/L		RA-MW-12B	Total	1
494108	Water	4-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-12B	Total	2
134253	Water	30-Mar-07	CHROMIUM	3.4	UG/L		RA-MW-12B	Total	2.2
234082	Water	5-Jun-07	CHROMIUM	3.0	UG/L		RA-MW-12B	Total	1.1



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

Well RA-MW-12C

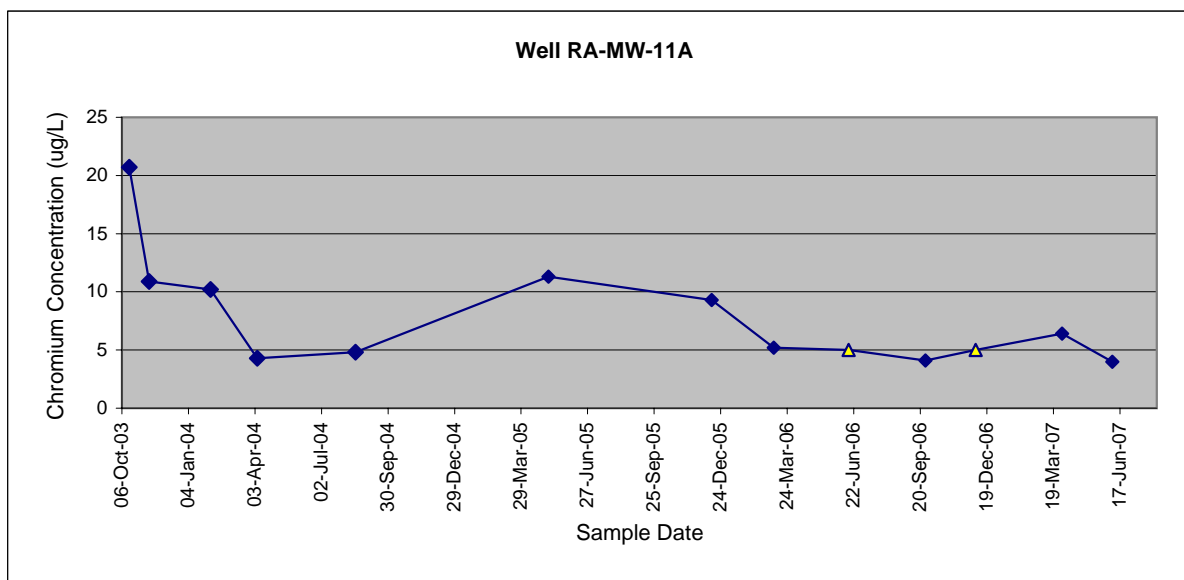
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2528	Water	17-Oct-03	CHROMIUM	3.3	UG/L	BJ	RA-MW-12C	Dissolved	>10
MJ27F9	Water	12-Nov-03	CHROMIUM	1.1	UG/L	BJ	RA-MW-12C	Dissolved	>10
MJ2AF2	Water	03-Feb-04	CHROMIUM	2.8	UG/L	J	RA-MW-12C	Total	1
MJ2BJ1	Water	06-Apr-04	CHROMIUM	2.7	UG/L	J	RA-MW-12C	Total	0
MJ4727	Water	17-Aug-04	CHROMIUM	0.98	UG/L	J	RA-MW-12C	Total	2
184255	Water	5-May-05	CHROMIUM	4.4	UG/L		RA-MW-12C	Total	5.2
05504284	Water	12-Dec-05	CHROMIUM	8.7	UG/L		RA-MW-12C	Total	3
104245	Water	7-Mar-06	CHROMIUM	2.2	UG/L		RA-MW-12C	Total	1
244317	Water	15-Jun-06	CHROMIUM	0.6	UG/L	J	RA-MW-12C	Total	0.3
394215	Water	28-Sep-06	CHROMIUM	1.5	UG/L		RA-MW-12C	Total	0.4
494117	Water	4-Dec-06	CHROMIUM	5.1	UG/L		RA-MW-12C	Total	3
134256	Water	31-Mar-07	CHROMIUM	5.6	UG/L		RA-MW-12C	Total	3.4
234079	Water	5-Jun-07	CHROMIUM	4.2	UG/L		RA-MW-12C	Total	1.9



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

Well RA-MW-11A

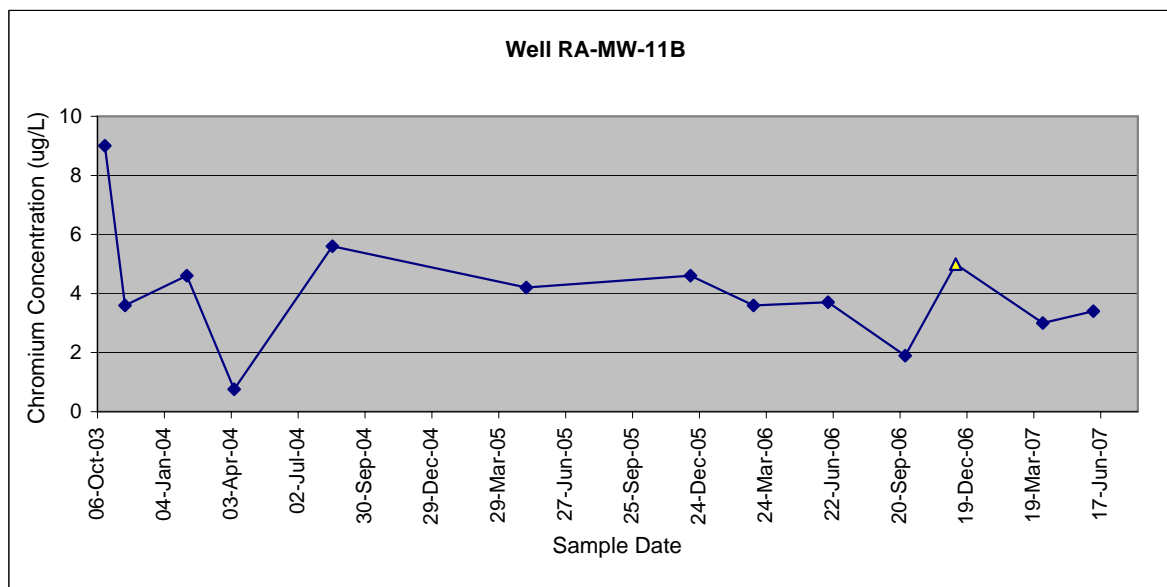
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2516	Water	16-Oct-03	CHROMIUM	20.7	UG/L		RA-MW-11A	Dissolved	>10
MJ27G1	Water	12-Nov-03	CHROMIUM	10.9	UG/L	J	RA-MW-11A	Dissolved	>10
MJ2AF4	Water	03-Feb-04	CHROMIUM	10.2	UG/L		RA-MW-11A	Dissolved	800
MJ2BJ3	Water	06-Apr-04	CHROMIUM	4.3	UG/L	J	RA-MW-11A	Dissolved	783
MJ4728	Water	17-Aug-04	CHROMIUM	4.8	UG/L	J	RA-MW-11A	Total	<10
184250	Water	5-May-05	CHROMIUM	11.3	UG/L		RA-MW-11A	Total	2
05504280	Water	12-Dec-05	CHROMIUM	9.3	UG/L		RA-MW-11A	Total	4
104232	Water	6-Mar-06	CHROMIUM	5.2	UG/L		RA-MW-11A	Total	1
244318	Water	15-Jun-06	CHROMIUM	5	UG/L	UJ	RA-MW-11A	Total	2
394213	Water	27-Sep-06	CHROMIUM	4.1	UG/L		RA-MW-11A	Total	0.5
494106	Water	4-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-11A	Total	1
134257	Water	31-Mar-07	CHROMIUM	6.4	UG/L		RA-MW-11A	Dissolved	4.1
234098	Water	7-Jun-07	CHROMIUM	4	UG/L		RA-MW-11A	Dissolved	0.6



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

Well RA-MW-11B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2518	Water	16-Oct-03	CHROMIUM	9	UG/L	BJ	RA-MW-11B	Dissolved	>10
MJ27G3	Water	12-Nov-03	CHROMIUM	3.6	UG/L	BJ	RA-MW-11B	Dissolved	>10
MJ2AF6	Water	03-Feb-04	CHROMIUM	4.6	UG/L	J	RA-MW-11B	Dissolved	550
MJ2BJ5	Water	7-Apr-04	CHROMIUM	0.76	UG/L	J	RA-MW-11B	Dissolved	1100
MJ4730	Water	17-Aug-04	CHROMIUM	5.6	UG/L	J	RA-MW-11B	Total	114
184251	Water	5-May-05	CHROMIUM	4.2	UG/L		RA-MW-11B	Total	7.1
05504281	Water	12-Dec-05	CHROMIUM	4.6	UG/L		RA-MW-11B	Dissolved	13
104241	Water	7-Mar-06	CHROMIUM	3.6	UG/L		RA-MW-11B	Total	5
244319	Water	15-Jun-06	CHROMIUM	3.7	UG/L		RA-MW-11B	Total	3
394214	Water	27-Sep-06	CHROMIUM	1.9	UG/L		RA-MW-11B	Total	0.3
494107	Water	4-Dec-06	CHROMIUM	5.0	UG/L	U	RA-MW-11B	Total	0.5
134260	Water	31-Mar-07	CHROMIUM	3.0	UG/L		RA-MW-11B	Dissolved	3.7
234099	Water	7-Jun-07	CHROMIUM	3.4	UG/L		RA-MW-11B	Total	0.7

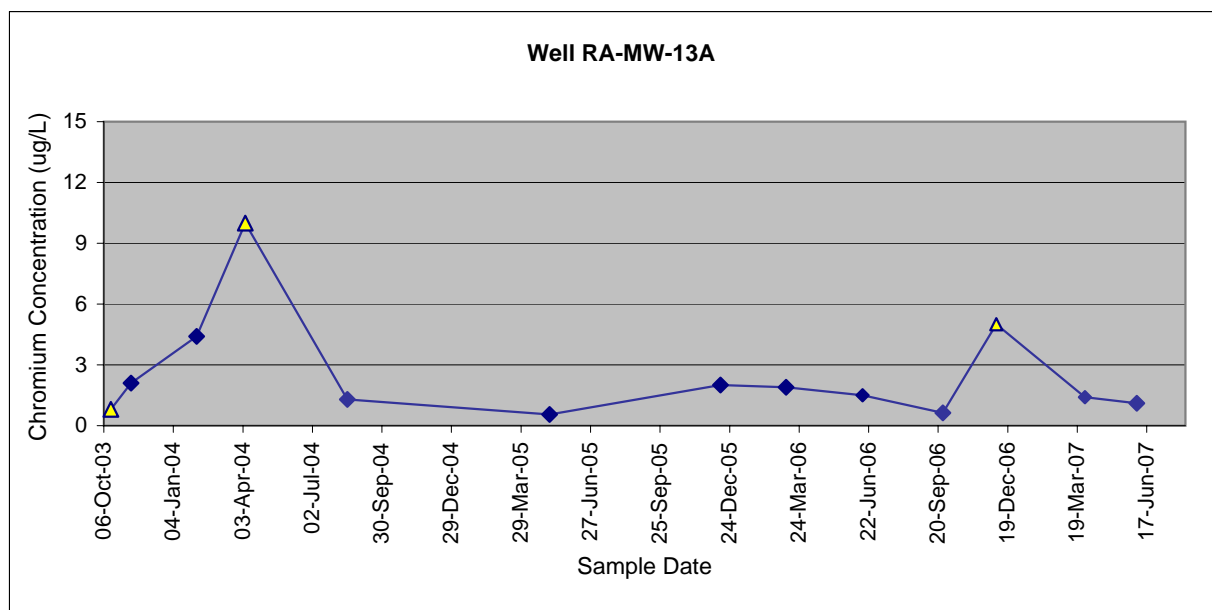


Note: The total Cr concentration was used for the August 2004 event because the dissolved concentration had a higher detection limit (10U).

Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

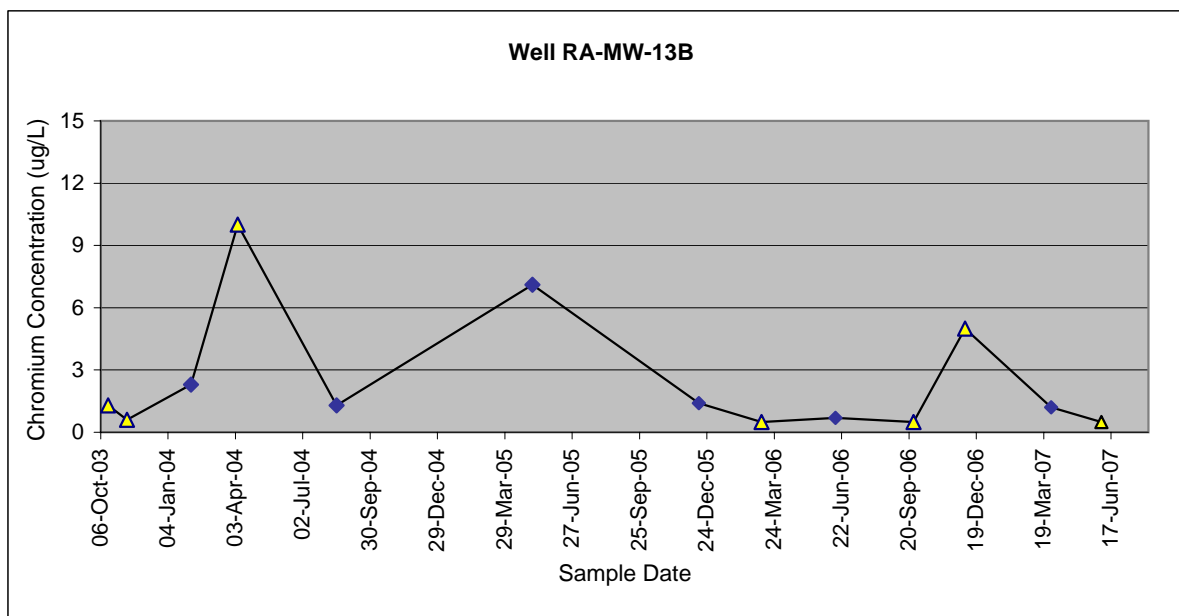
Well RA-MW-13A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2508	Water	15-Oct-03	CHROMIUM	0.8	UG/L	U	RA-MW-13A	Total	<10
MJ27E2	Water	10-Nov-03	CHROMIUM	2.1	UG/L	BJ	RA-MW-13A	Total	>10
MJ2AG1	Water	03-Feb-04	CHROMIUM	4.4	UG/L	J	RA-MW-13A	Total	4
MJ2BH4	Water	6-Apr-04	CHROMIUM	10	UG/L	U	RA-MW-13A	Total	7
MJ4718	Water	16-Aug-04	CHROMIUM	1.3	UG/L	J	RA-MW-13A	Total	9
184261	Water	5-May-05	CHROMIUM	0.56	UG/L		RA-MW-13A	Total	6.4
05504285	Water	12-Dec-05	CHROMIUM	2	UG/L		RA-MW-13A	Total	6.4
104246	Water	7-Mar-06	CHROMIUM	1.9	UG/L		RA-MW-13A	Total	4
244301	Water	14-Jun-06	CHROMIUM	1.5	UG/L		RA-MW-13A	Total	0.7
394194	Water	26-Sep-06	CHROMIUM	0.63	UG/L		RA-MW-13A	Total	2
494102	Water	4-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-13A	Total	0.3
134233	Water	29-Mar-07	CHROMIUM	1.4	UG/L		RA-MW-13A	Total	7.7
234065	Water	4-Jun-07	CHROMIUM	1.1	UG/L		RA-MW-13A	Total	6.3



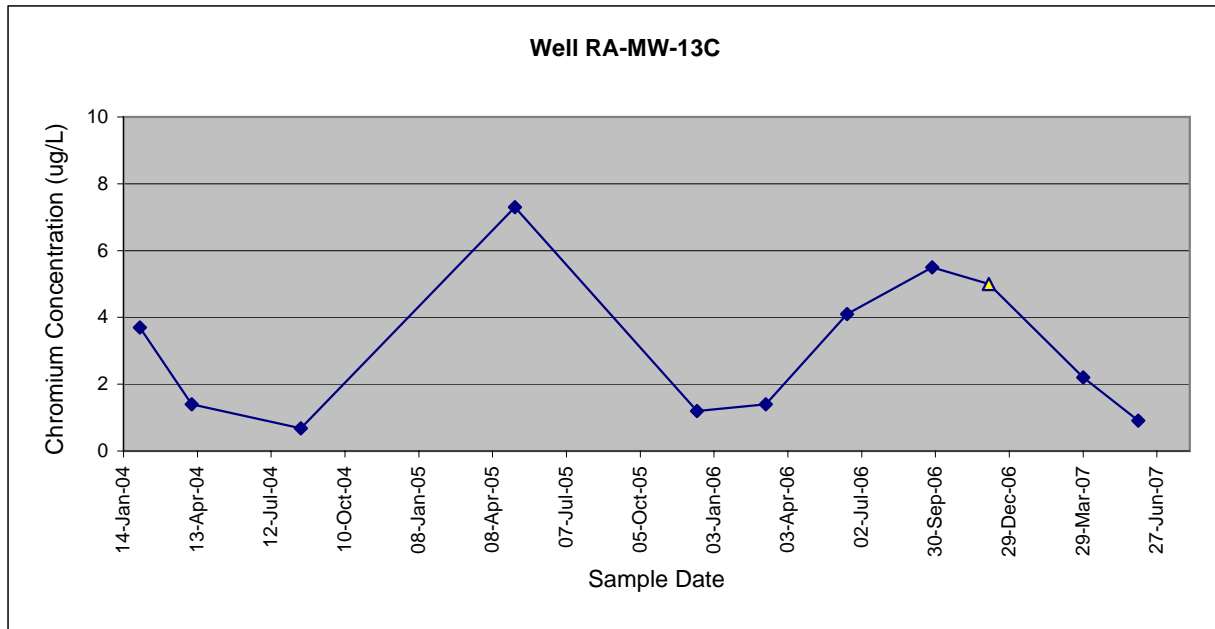
Well RA-MW-13B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2509	Water	16-Oct-03	CHROMIUM	1.3	UG/L	U	RA-MW-13B	Total	<10
MJ27E3	Water	10-Nov-03	CHROMIUM	0.6	UG/L	UJ	RA-MW-13B	Total	<10
MJ2AF8	Water	03-Feb-04	CHROMIUM	2.3	UG/L	J	RA-MW-13B	Total	3
MJ2BH5	Water	6-Apr-04	CHROMIUM	10	UG/L	U	RA-MW-13B	Total	1
MJ4720	Water	16-Aug-04	CHROMIUM	1.3	UG/L	J	RA-MW-13B	Total	2
184262	Water	5-May-05	CHROMIUM	7.1	UG/L		RA-MW-13B	Total	2.8
05504286	Water	13-Dec-05	CHROMIUM	1.4	UG/L		RA-MW-13B	Total	1.7
104247	Water	7-Mar-06	CHROMIUM	0.5	UG/L	U	RA-MW-13B	Total	0
244302	Water	14-Jun-06	CHROMIUM	0.7	UG/L		RA-MW-13B	Total	0.8
394195	Water	26-Sep-06	CHROMIUM	0.5	UG/L	U	RA-MW-13B	Total	2
494103	Water	4-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-13B	Total	0.5
134234	Water	29-Mar-07	CHROMIUM	1.2	UG/L		RA-MW-13B	Total	0.5
234066	Water	4-Jun-07	CHROMIUM	0.5	UG/L	U	RA-MW-13B	Total	2.1



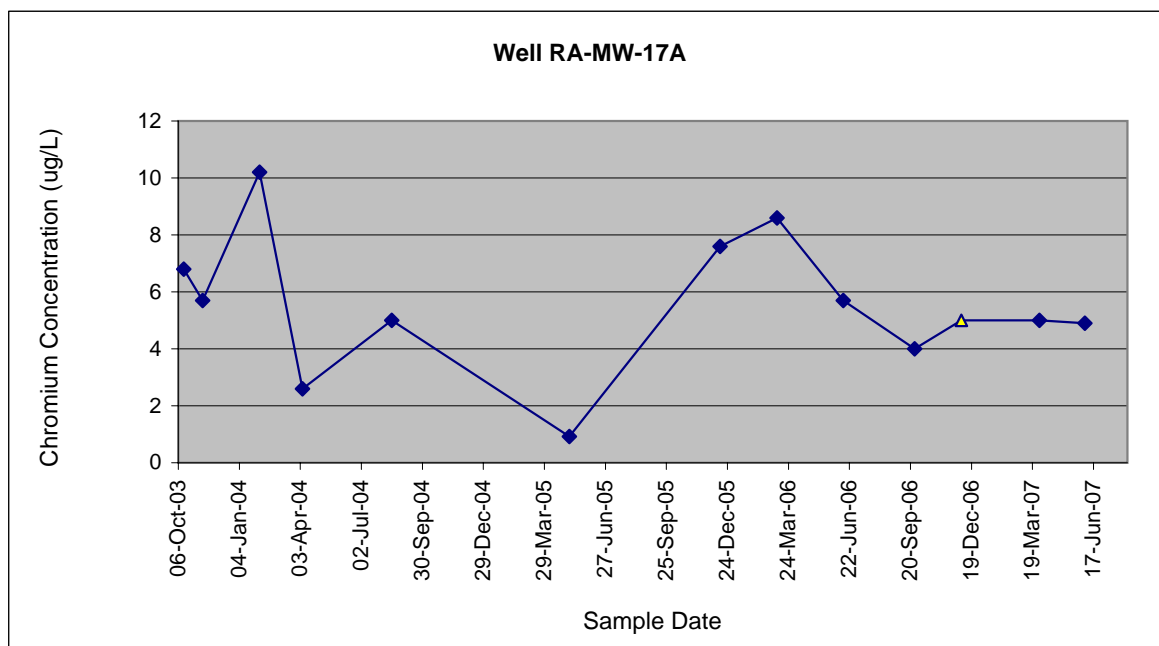
Well RA-MW-13C

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AF9	Water	03-Feb-04	CHROMIUM	3.7	UG/L	J	RA-MW-13C	Total	2
MJ2BH6	Water	6-Apr-04	CHROMIUM	1.4	UG/L	J	RA-MW-13C	Total	0
MJ4721	Water	17-Aug-04	CHROMIUM	0.68	UG/L	J	RA-MW-13C	Total	2
184263	Water	5-May-05	CHROMIUM	7.3	UG/L		RA-MW-13C	Total	9.8
05504287	Water	13-Dec-05	CHROMIUM	1.2	UG/L		RA-MW-13C	Total	0.1
104248	Water	7-Mar-06	CHROMIUM	1.4	UG/L		RA-MW-13C	Total	6
244303	Water	14-Jun-06	CHROMIUM	4.1	UG/L		RA-MW-13C	Total	5
394196	Water	26-Sep-06	CHROMIUM	5.5	UG/L		RA-MW-13C	Total	9.7
494104	Water	4-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-13C	Total	8
134235	Water	29-Mar-07	CHROMIUM	2.2	UG/L		RA-MW-13C	Total	3.5
234067	Water	4-Jun-07	CHROMIUM	0.91	UG/L		RA-MW-13C	Total	2.3



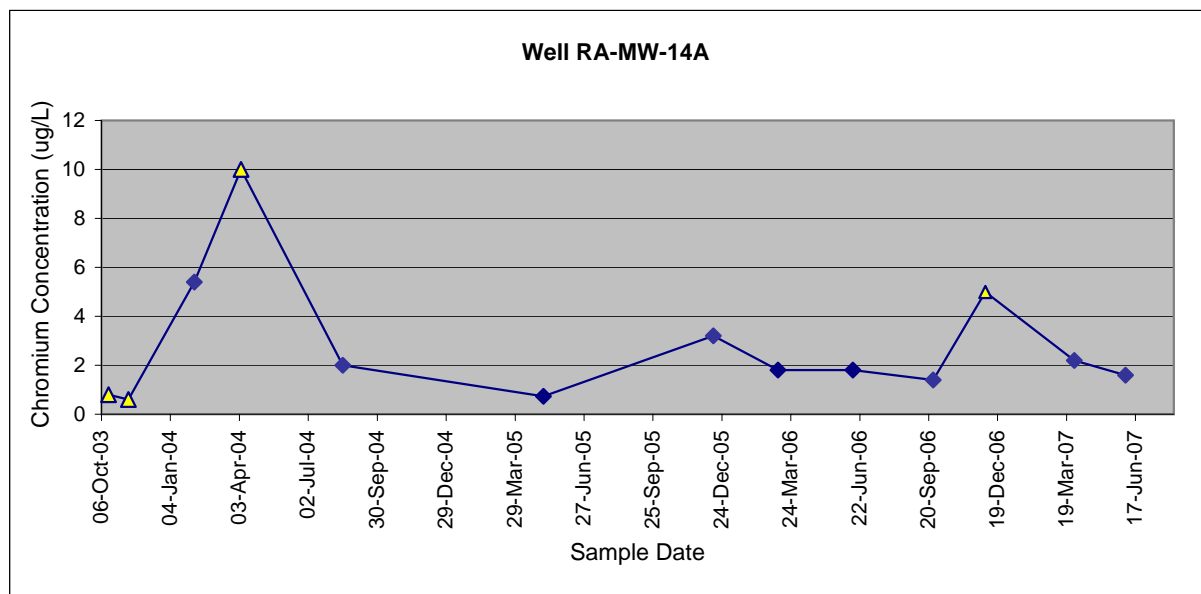
Well RA-MW-17A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2501	Water	14-Oct-03	CHROMIUM	6.8	UG/L	BJ	RA-MW-17A	Total	<10
MJ27E5	Water	11-Nov-03	CHROMIUM	5.7	UG/L	BJ	RA-MW-17A	Total	<10
MJ2AG0	Water	03-Feb-04	CHROMIUM	10.2	UG/L	J	RA-MW-17A	Total	1
MJ2BH7	Water	6-Apr-04	CHROMIUM	2.6	UG/L	J	RA-MW-17A	Total	0
MJ4715	Water	16-Aug-04	CHROMIUM	5	UG/L	J	RA-MW-17A	Total	1
184260	Water	5-May-05	CHROMIUM	0.92	UG/L		RA-MW-17A	Total	10
05504299	Water	13-Dec-05	CHROMIUM	7.6	UG/L		RA-MW-17A	Total	3.1
104240	Water	7-Mar-06	CHROMIUM	8.6	UG/L		RA-MW-17A	Total	7
244293	Water	13-Jun-06	CHROMIUM	5.7	UG/L		RA-MW-17A	Total	1
394193	Water	26-Sep-06	CHROMIUM	4.0	UG/L		RA-MW-17A	Total	1
494105	Water	4-Dec-06	CHROMIUM	5.0	UG/L	U	RA-MW-17A	Total	0.8
134232	Water	29-Mar-07	CHROMIUM	5.0	UG/L		RA-MW-17A	Total	1.2
234064	Water	4-Jun-07	CHROMIUM	4.9	UG/L		RA-MW-17A	Total	2.7



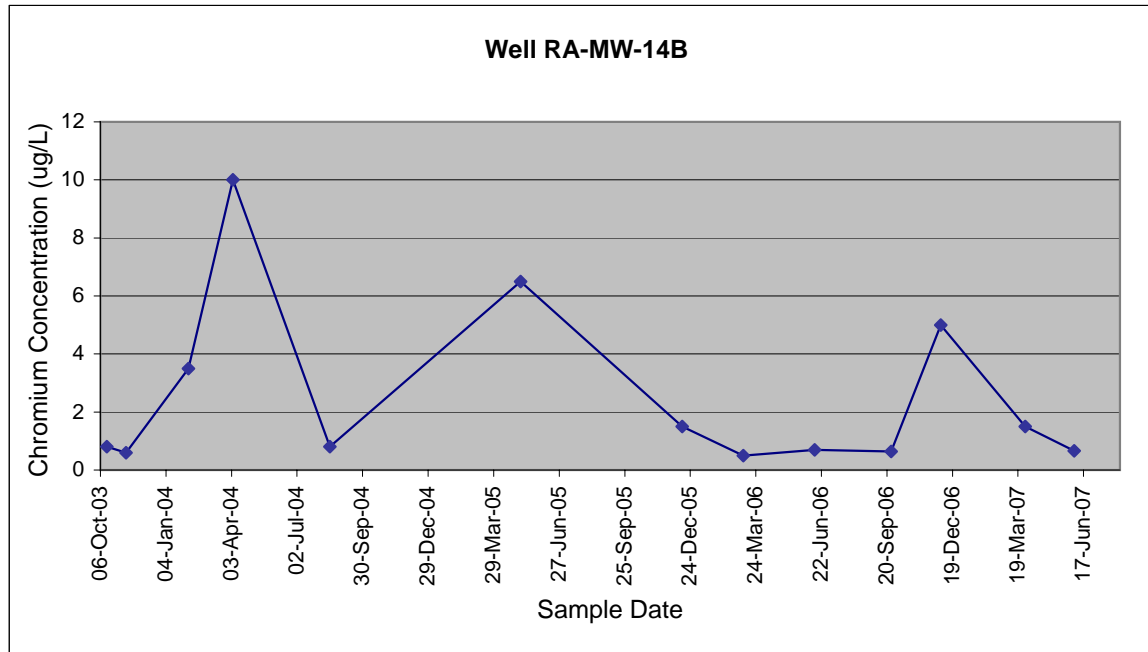
Well RA-MW-14A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2504	Water	15-Oct-03	CHROMIUM	0.8	UG/L	U	RA-MW-14A	Total	<10
MJ27D8	Water	10-Nov-03	CHROMIUM	0.6	UG/L	UJ	RA-MW-14A	Total	<10
MJ2AG2	Water	04-Feb-04	CHROMIUM	5.4	UG/L	J	RA-MW-14A	Total	0
MJ2BG5	Water	5-Apr-04	CHROMIUM	10	UG/L	U	RA-MW-14A	Total	5
MJ4712	Water	16-Aug-04	CHROMIUM	2	UG/L	J	RA-MW-14A	Total	3
184258	Water	5-May-05	CHROMIUM	0.73	UG/L		RA-MW-14A	Total	7.5
05504294	Water	13-Dec-05	CHROMIUM	3.2	UG/L		RA-MW-14A	Total	1.5
104250	Water	7-Mar-06	CHROMIUM	1.8	UG/L		RA-MW-14A	Total	1
244294	Water	13-Jun-06	CHROMIUM	1.8	UG/L		RA-MW-14A	Total	1
394198	Water	26-Sep-06	CHROMIUM	1.4	UG/L		RA-MW-14A	Total	0.3
494100	Water	3-Dec-06	CHROMIUM	5.0	UG/L	U	RA-MW-14A	Total	0.1
134230	Water	29-Mar-07	CHROMIUM	2.2	UG/L		RA-MW-14A	Total	0.5
234062	Water	4-Jun-07	CHROMIUM	1.6	UG/L		RA-MW-14A	Total	1.6



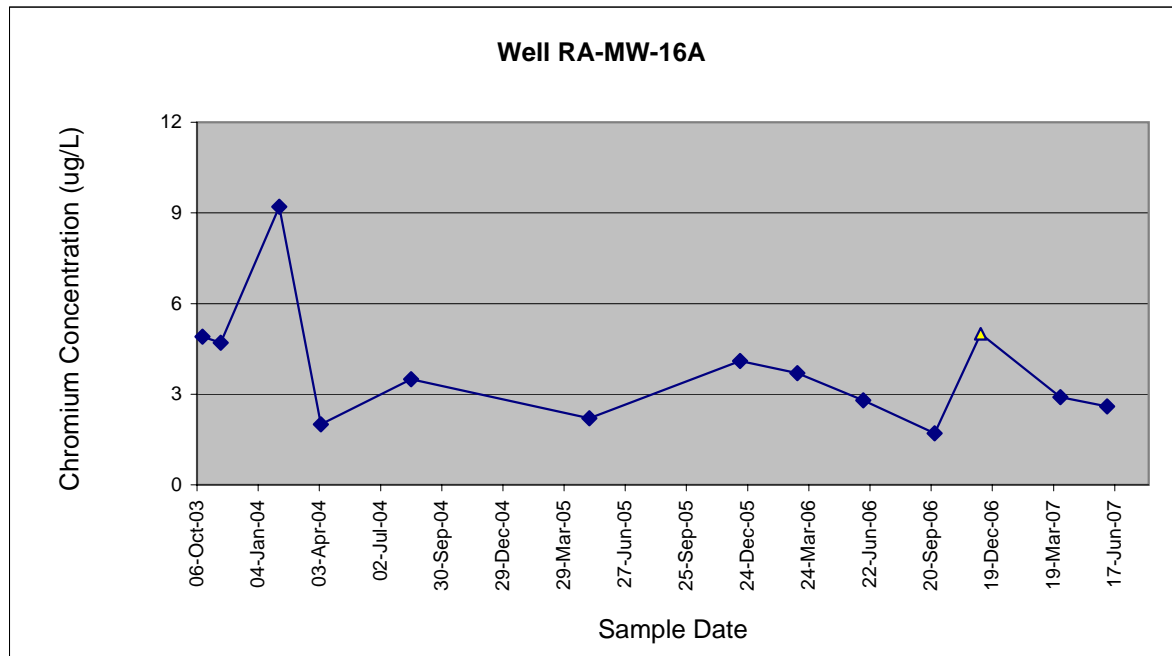
Well RA-MW-14B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2505	Water	15-Oct-03	CHROMIUM	0.8	UG/L	U	RA-MW-14B	Total	<10
MJ27D9	Water	10-Nov-03	CHROMIUM	0.6	UG/L	R	RA-MW-14B	Total	<10
MJ2AG4	Water	04-Feb-04	CHROMIUM	3.5	UG/L	J	RA-MW-14B	Total	1
MJ2BG7	Water	5-Apr-04	CHROMIUM	10	UG/L	U	RA-MW-14B	Total	0
MJ4714	Water	16-Aug-04	CHROMIUM	0.81	UG/L	J	RA-MW-14B	Total	2
184259	Water	5-May-05	CHROMIUM	6.5	UG/L		RA-MW-14B	Total	5.6
05504295	Water	13-Dec-05	CHROMIUM	1.5	UG/L		RA-MW-14B	Total	6.1
104249	Water	7-Mar-06	CHROMIUM	0.5	UG/L	U	RA-MW-14B	Total	4
244295	Water	13-Jun-06	CHROMIUM	0.7	UG/L		RA-MW-14B	Total	9
394199	Water	26-Sep-06	CHROMIUM	0.64	UG/L		RA-MW-14B	Total	2
494101	Water	3-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-14B	Total	0.2
134231	Water	29-Mar-07	CHROMIUM	1.5	UG/L		RA-MW-14B	Total	0.6
234063	Water	4-Jun-07	CHROMIUM	0.66	UG/L		RA-MW-14B	Total	7.7



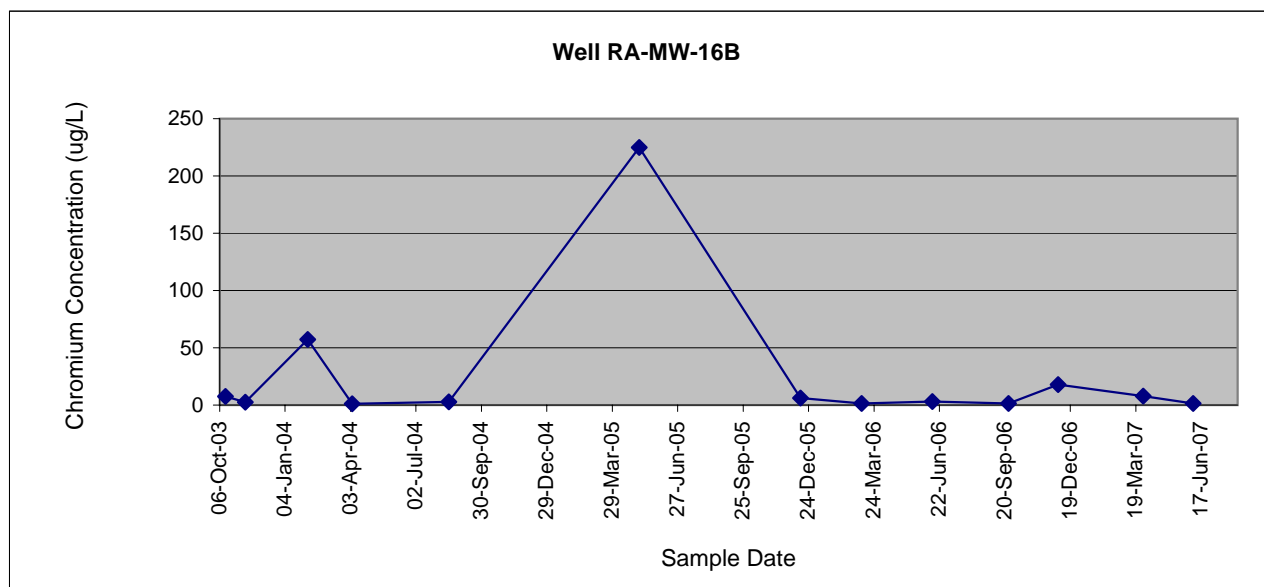
Well RA-MW-16A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2502	Water	14-Oct-03	CHROMIUM	4.9	UG/L	BJ	RA-MW-16A	Total	<10
MJ27E0	Water	10-Nov-03	CHROMIUM	4.7	UG/L	BJ	RA-MW-16A	Total	<10
MJ2AG5	Water	04-Feb-04	CHROMIUM	9.2	UG/L	J	RA-MW-16A	Total	1
MJ2BG8	Water	5-Apr-04	CHROMIUM	2	UG/L	J	RA-MW-16A	Total	1
MJ4716	Water	16-Aug-04	CHROMIUM	3.5	UG/L	J	RA-MW-16A	Total	2
184257	Water	5-May-05	CHROMIUM	2.2	UG/L		RA-MW-16A	Total	8.5
05504293	Water	13-Dec-05	CHROMIUM	4.1	UG/L		RA-MW-16A	Total	1.2
104238	Water	7-Mar-06	CHROMIUM	3.7	UG/L		RA-MW-16A	Total	1.7
244304	Water	12-Jun-06	CHROMIUM	2.8	UG/L		RA-MW-16A	Total	1
394189	Water	25-Sep-06	CHROMIUM	1.7	UG/L		RA-MW-16A	Total	1
494087	Water	2-Dec-06	CHROMIUM	5	UG/L	U	RA-MW-16A	Total	0.1
134236	Water	29-Mar-07	CHROMIUM	2.9	UG/L		RA-MW-16A	Total	1.7
234085	Water	6-Jun-07	CHROMIUM	2.6	UG/L		RA-MW-16A	Total	1



Well RA-MW-16B

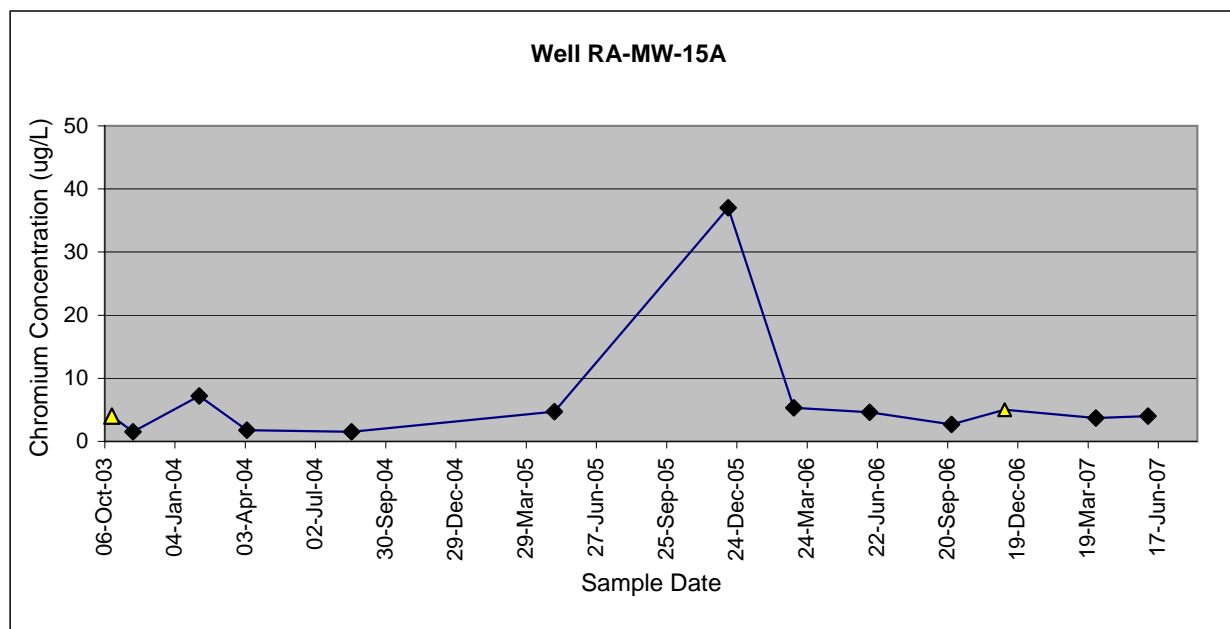
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2503	Water	14-Oct-03	CHROMIUM	7.6	UG/L	BJ	RA-MW-16B	Total	<10
MJ27E1	Water	10-Nov-03	CHROMIUM	2.5	UG/L	BJ	RA-MW-16B	Total	<10
MJ2AG6	Water	04-Feb-04	CHROMIUM	57.4	UG/L	BJ	RA-MW-16B	Total	1
MJ2BH0	Water	5-Apr-04	CHROMIUM	1	UG/L	J	RA-MW-16B	Dissolved	0
MJ4717	Water	16-Aug-04	CHROMIUM	2.8	UG/L	J	RA-MW-16B	Total	3.6
184256	Water	5-May-05	CHROMIUM	225	UG/L		RA-MW-16B	Total	5.7
05504291	Water	13-Dec-05	CHROMIUM	6.1	UG/L		RA-MW-16B	Dissolved	3.9
104239	Water	7-Mar-06	CHROMIUM	1.3	UG/L		RA-MW-16B	Total	0
244305	Water	12-Jun-06	CHROMIUM	3.2	UG/L		RA-MW-16B	Total	0.3
394187	Water	25-Sep-06	CHROMIUM	1.3	UG/L		RA-MW-16B	Dissolved	0.7
494089	Water	2-Dec-06	CHROMIUM	18	UG/L		RA-MW-16B	Dissolved	0.2
134238	Water	29-Mar-07	CHROMIUM	7.9	UG/L		RA-MW-16B	Dissolved	3.7
234087	Water	6-Jun-07	CHROMIUM	1.4	UG/L		RA-MW-16B	Dissolved	0.3



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

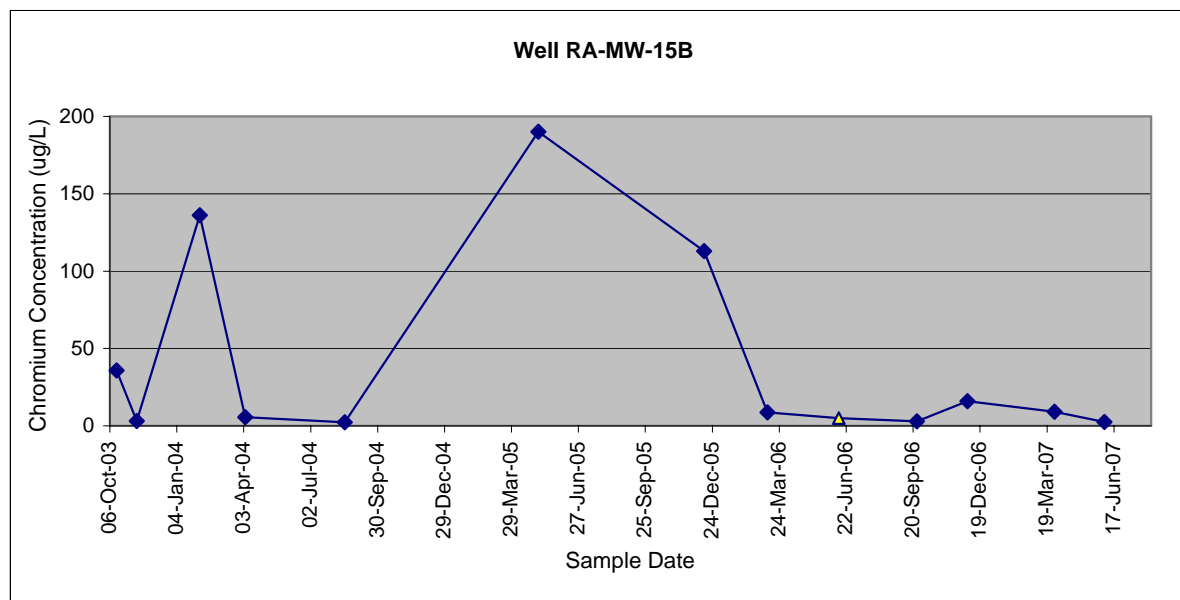
Well RA-MW-15A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2506	Water	15-Oct-03	CHROMIUM	4	UG/L	U	RA-MW-15A	Total	<10
MJ27E8	Water	11-Nov-03	CHROMIUM	1.5	UG/L	BJ	RA-MW-15A	Total	<10
MJ2AG7	Water	04-Feb-04	CHROMIUM	7.2	UG/L	J	RA-MW-15A	Total	1
MJ2BH1	Water	5-Apr-04	CHROMIUM	1.8	UG/L	J	RA-MW-15A	Total	0
MJ4722	Water	17-Aug-04	CHROMIUM	1.5	UG/L	J	RA-MW-15A	Total	0
184248	Water	4-May-05	CHROMIUM	4.7	UG/L		RA-MW-15A	Total	2
05504290	Water	13-Dec-05	CHROMIUM	37	UG/L		RA-MW-15A	Total	1.3
104251	Water	7-Mar-06	CHROMIUM	5.3	UG/L		RA-MW-15A	Total	0
244290	Water	12-Jun-06	CHROMIUM	4.6	UG/L		RA-MW-15A	Total	0.6
394192	Water	25-Sep-06	CHROMIUM	2.7	UG/L		RA-MW-15A	Total	0.2
494090	Water	2-Dec-06	CHROMIUM	5.0	UG/L	U	RA-MW-15A	Total	2
134241	Water	29-Mar-07	CHROMIUM	3.7	UG/L		RA-MW-15A	Total	0.3
234068	Water	4-Jun-07	CHROMIUM	4.0	UG/L		RA-MW-15A	Total	0.5



Well RA-MW-15B

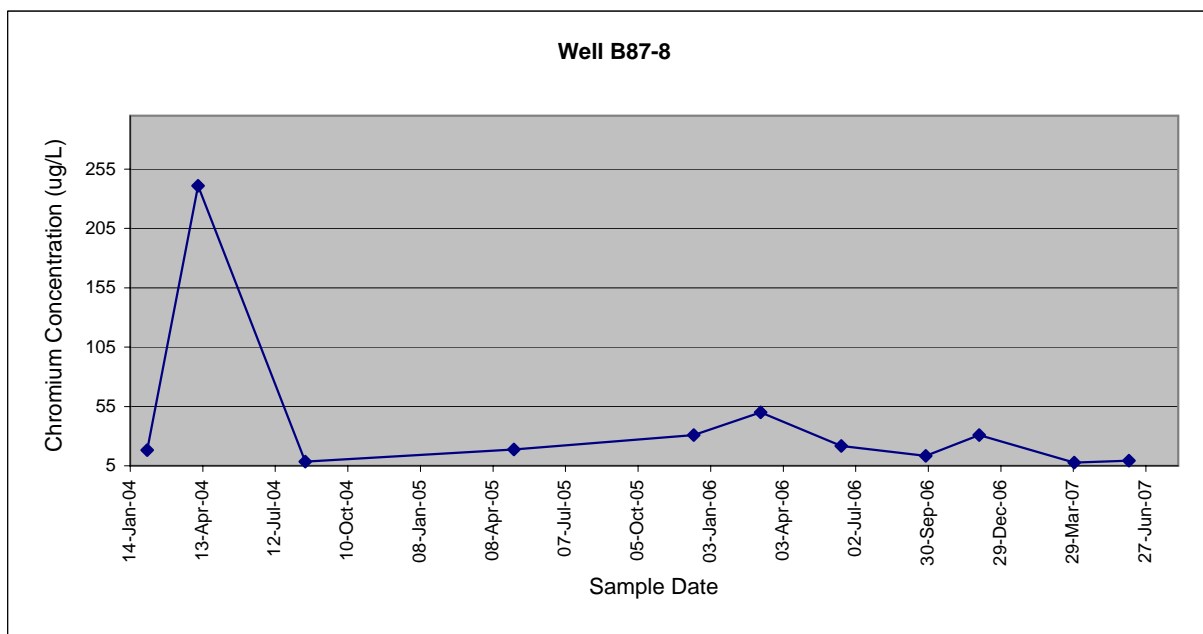
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2507	Water	15-Oct-03	CHROMIUM	35.8	UG/L		RA-MW-15B	Total	<10
MJ27E9	Water	11-Nov-03	CHROMIUM	3.2	UG/L	BJ	RA-MW-15B	Total	<10
MJ2AG8	Water	04-Feb-04	CHROMIUM	136	UG/L		RA-MW-15B	Total	2
MJ2BH2	Water	5-Apr-04	CHROMIUM	5.5	UG/L	J	RA-MW-15B	Total	0
MJ4723	Water	17-Aug-04	CHROMIUM	2.2	UG/L	J	RA-MW-15B	Total	1
184249	Water	4-May-05	CHROMIUM	190	UG/L		RA-MW-15B	Total	9.7
05504288	Water	13-Dec-05	CHROMIUM	113	UG/L		RA-MW-15B	Total	3.5
104252	Water	8-Mar-06	CHROMIUM	8.7	UG/L		RA-MW-15B	Dissolved	5
244292	Water	12-Jun-06	CHROMIUM	5	UG/L	U	RA-MW-15B	Dissolved	4
394190	Water	25-Sep-06	CHROMIUM	2.8	UG/L		RA-MW-15B	Dissolved	4
494092	Water	2-Dec-06	CHROMIUM	16	UG/L		RA-MW-15B	Dissolved	7
134243	Water	29-Mar-07	CHROMIUM	9.2	UG/L		RA-MW-15B	Dissolved	2.4
234069	Water	4-Jun-07	CHROMIUM	2.4	UG/L		RA-MW-15B	Dissolved	3.4



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

Well B87-8

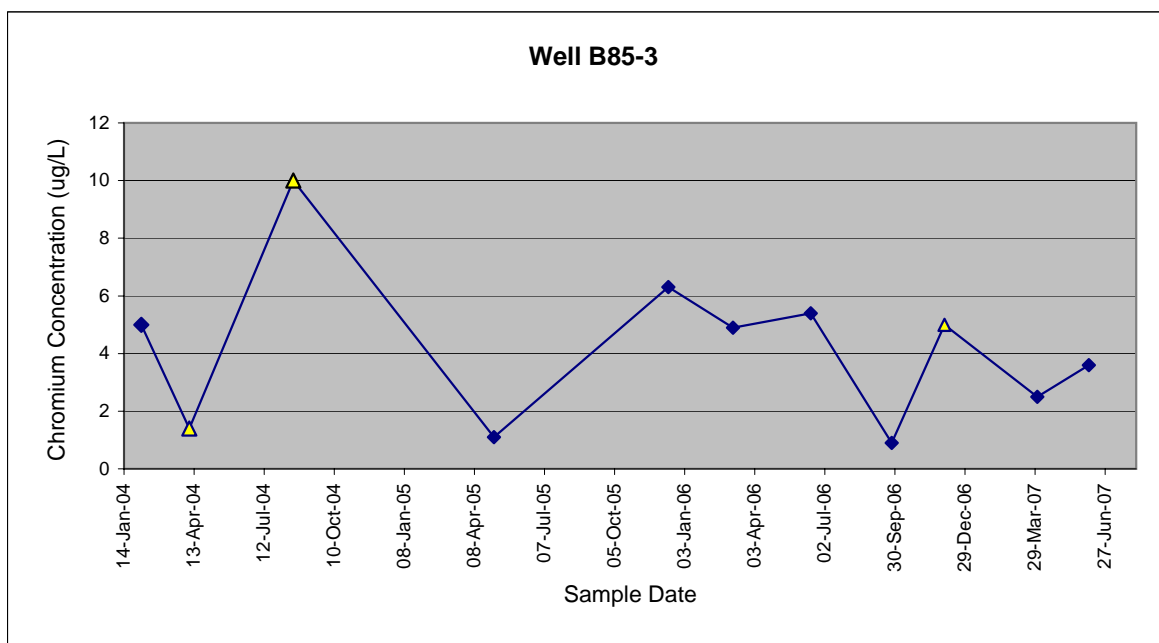
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AG9	Water	04-Feb-04	CHROMIUM	18.2	UG/L		B87-8	Total	2
MJ2BK0	Water	7-Apr-04	CHROMIUM	241	UG/L		B87-8	Total	8
MJ4737	Water	18-Aug-04	CHROMIUM	8.5	UG/L	J	B87-8	Dissolved	36
184247	Water	4-May-05	CHROMIUM	18.8	UG/L		B87-8	Total	6.5
05504297	Water	13-Dec-05	CHROMIUM	31	UG/L		B87-8	Total	5.1
104236	Water	6-Mar-06	CHROMIUM	50	UG/L		B87-8	Total	8
244308	Water	14-Jun-06	CHROMIUM	21.8	UG/L		B87-8	Total	3
394204	Water	27-Sep-06	CHROMIUM	13.4	UG/L		B87-8	Dissolved	13
494082	Water	2-Dec-06	CHROMIUM	31	UG/L		B87-8	Total	0.1
134251	Water	30-Mar-07	CHROMIUM	7.8	UG/L		B87-8	Dissolved	11
234089	Water	6-Jun-07	CHROMIUM	9.2	UG/L		B87-8	Dissolved	0.9



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

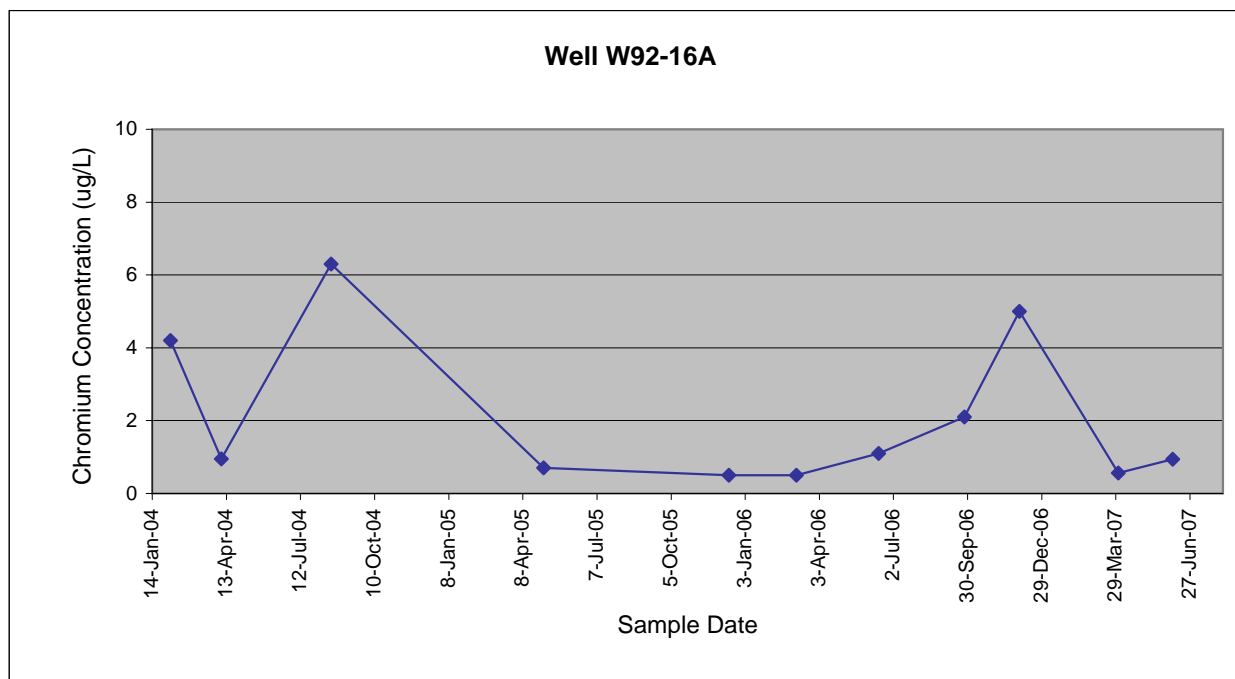
Well B85-3

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH0	Water	05-Feb-04	CHROMIUM	5	UG/L	J	B85-3	Total	1
MJ2BJ6	Water	7-Apr-04	CHROMIUM	1.4	UG/L	U	B85-3	Total	3
MJ4732	Water	18-Aug-04	CHROMIUM	10	UG/L	U	B85-3	Total	0
184232	Water	3-May-05	CHROMIUM	1.1	UG/L		B85-3	Total	2.8
05504298	Water	13-Dec-05	CHROMIUM	6.3	UG/L		B85-3	Total	8.1
104235	Water	6-Mar-06	CHROMIUM	4.9	UG/L		B85-3	Total	7
244311	Water	14-Jun-06	CHROMIUM	5.4	UG/L		B85-3	Total	6
394197	Water	26-Sep-06	CHROMIUM	0.9	UG/L		B85-3	Total	1
494094	Water	3-Dec-06	CHROMIUM	5	UG/L	U	B85-3	Total	7
134266	Water	1-Apr-07	CHROMIUM	2.5	UG/L		B85-3	Total	5.1
234092	Water	6-Jun-07	CHROMIUM	3.6	UG/L		B85-3	Total	4



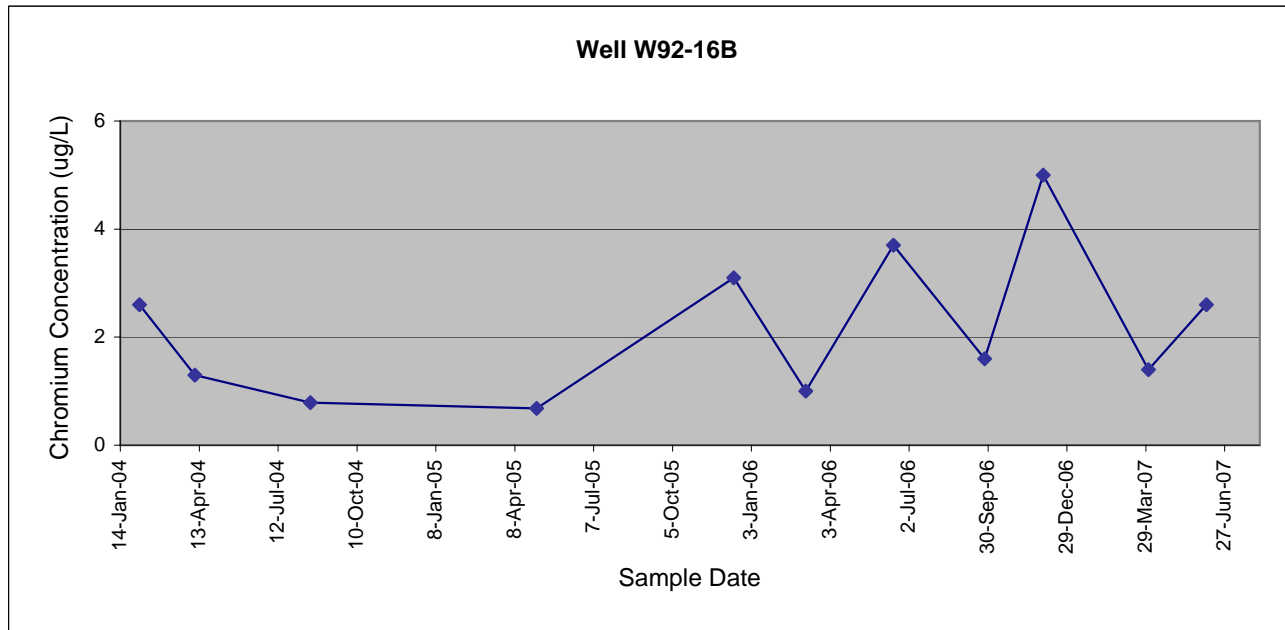
Well W92-16A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH1	Water	05-Feb-04	CHROMIUM	4.2	UG/L	J	W92-16A	Total	2
MJ2BJ7	Water	7-Apr-04	CHROMIUM	0.95	UG/L	U	W92-16A	Total	0
MJ4734	Water	18-Aug-04	CHROMIUM	6.3	UG/L	J	W92-16A	Total	0
184234	Water	3-May-05	CHROMIUM	0.7	UG/L		W92-16A	Total	0.7
05504311	Water	14-Dec-05	CHROMIUM	0.5	UG/L	U	W92-16A	Total	0.7
104234	Water	6-Mar-06	CHROMIUM	0.5	UG/L	U	W92-16A	Total	0.7
244304	Water	14-Jun-06	CHROMIUM	1.1	UG/L		W92-16A	Total	2
394200	Water	26-Sep-06	CHROMIUM	2.1	UG/L		W92-16A	Total	4
494085	Water	2-Dec-06	CHROMIUM	5	UG/L	U	W92-16A	Total	0.1
134267	Water	1-Apr-07	CHROMIUM	0.56	UG/L		W92-16A	Total	2.5
234093	Water	6-Jun-07	CHROMIUM	0.94	UG/L		W92-16A	Total	1.8



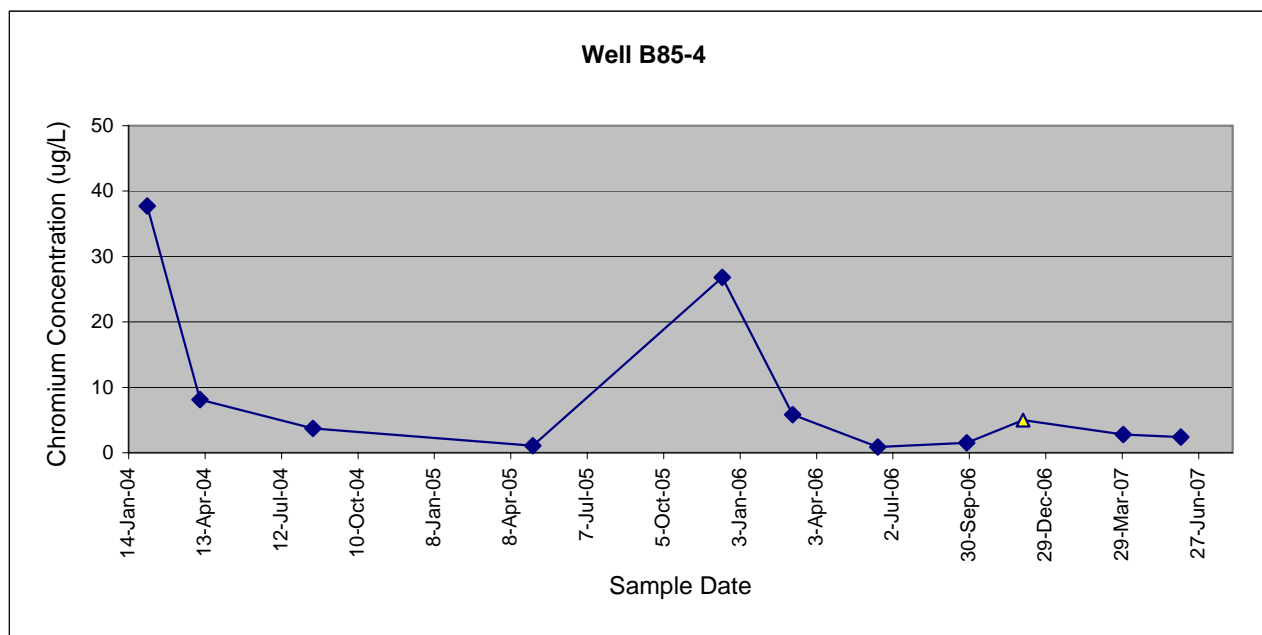
Well W92-16B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH3	Water	05-Feb-04	CHROMIUM	2.6	UG/L	J	W92-16B	Total	7
MJ2BJ8	Water	7-Apr-04	CHROMIUM	1.3	UG/L	U	W92-16B	Total	2
MJ4735	Water	18-Aug-04	CHROMIUM	0.79	UG/L	J	W92-16B	Total	<10
184233	Water	3-May-05	CHROMIUM	0.68	UG/L		W92-16B	Total	3.9
05504312	Water	14-Dec-05	CHROMIUM	3.1	UG/L		W92-16B	Total	5.1
104233	Water	6-Mar-06	CHROMIUM	1	UG/L		W92-16B	Total	8.7
244305	Water	14-Jun-06	CHROMIUM	3.7	UG/L		W92-16B	Total	7
394201	Water	26-Sep-06	CHROMIUM	1.6	UG/L		W92-16B	Total	0.7
494086	Water	2-Dec-06	CHROMIUM	5	UG/L	U	W92-16B	Total	1
134268	Water	1-Apr-07	CHROMIUM	1.4	UG/L		W92-16B	Total	6.8
234094	Water	6-Jun-07	CHROMIUM	2.6	UG/L		W92-16B	Total	0.6



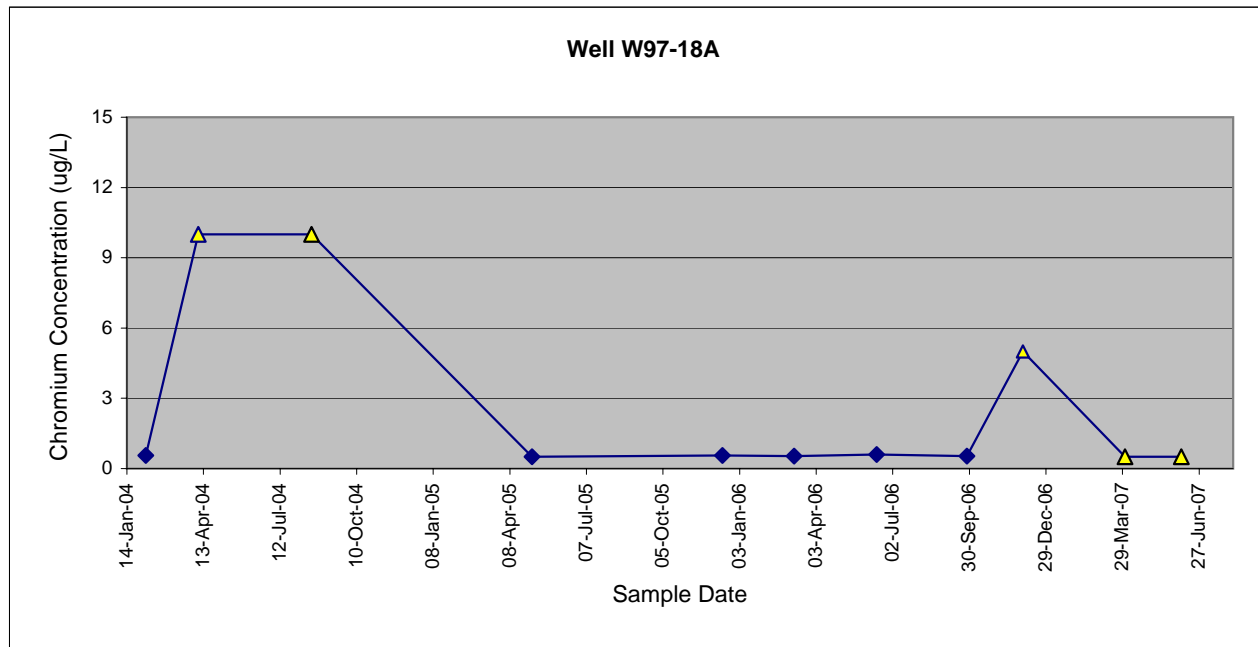
Well B85-4

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH4	Water	05-Feb-04	CHROMIUM	37.7	UG/L		B85-4	Total	1
MJ2BK1	Water	7-Apr-04	CHROMIUM	8.1	UG/L	J	B85-4	Total	0
MJ4738	Water	18-Aug-04	CHROMIUM	3.7	UG/L	J	B85-4	Total	4
184246	Water	4-May-05	CHROMIUM	1.1	UG/L		B85-4	Total	2
05504296	Water	13-Dec-05	CHROMIUM	26.8	UG/L		B85-4	Total	5.7
104237	Water	6-Mar-06	CHROMIUM	5.8	UG/L		B85-4	Total	3.9
244310	Water	14-Jun-06	CHROMIUM	0.9	UG/L		B85-4	Total	0.3
394207	Water	27-Sep-06	CHROMIUM	1.5	UG/L		B85-4	Total	1
494084	Water	2-Dec-06	CHROMIUM	5	UG/L	U	B85-4	Total	0
134252	Water	30-Mar-07	CHROMIUM	2.8	UG/L		B85-4	Total	1.4
234091	Water	6-Jun-07	CHROMIUM	2.4	UG/L		B85-4	Total	2.1



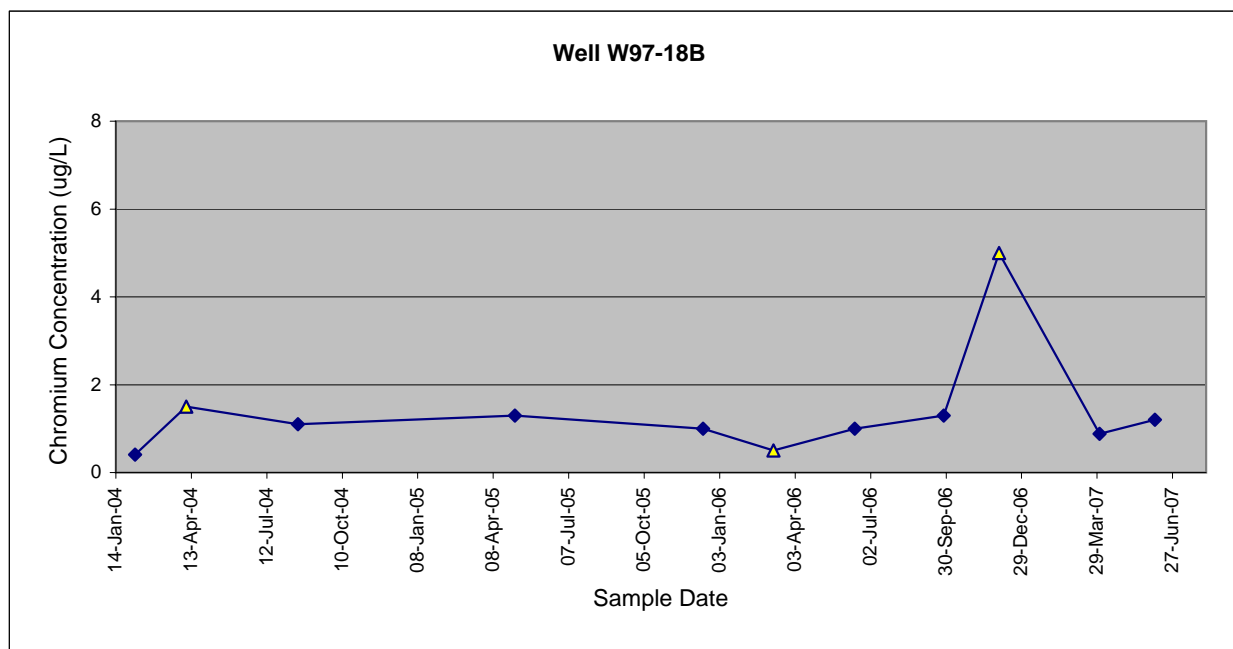
Well W97-18A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH5	Water	05-Feb-04	CHROMIUM	0.56	UG/L	J	W97-18A	Total	14
MJ2BK2	Water	7-Apr-04	CHROMIUM	10	UG/L	U	W97-18A	Total	0
MJ4739	Water	18-Aug-04	CHROMIUM	10	UG/L	U	W97-18A	Total	5
184244	Water	4-May-05	CHROMIUM	0.5	UG/L		W97-18A	Total	1
05504300	Water	14-Dec-05	CHROMIUM	0.56	UG/L		W97-18A	Total	4
104256	Water	8-Mar-06	CHROMIUM	0.53	UG/L		W97-18A	Total	0
244298	Water	13-Jun-06	CHROMIUM	0.6	UG/L		W97-18A	Total	9
394209	Water	27-Sep-06	CHROMIUM	0.53	UG/L		W97-18A	Total	6
494080	Water	2-Dec-06	CHROMIUM	5	UG/L	U	W97-18A	Total	1
134269	Water	1-Apr-07	CHROMIUM	0.5	UG/L	U	W97-18A	Total	8.5
234095	Water	6-Jun-07	CHROMIUM	0.5	UG/L	U	W97-18A	Total	0.6



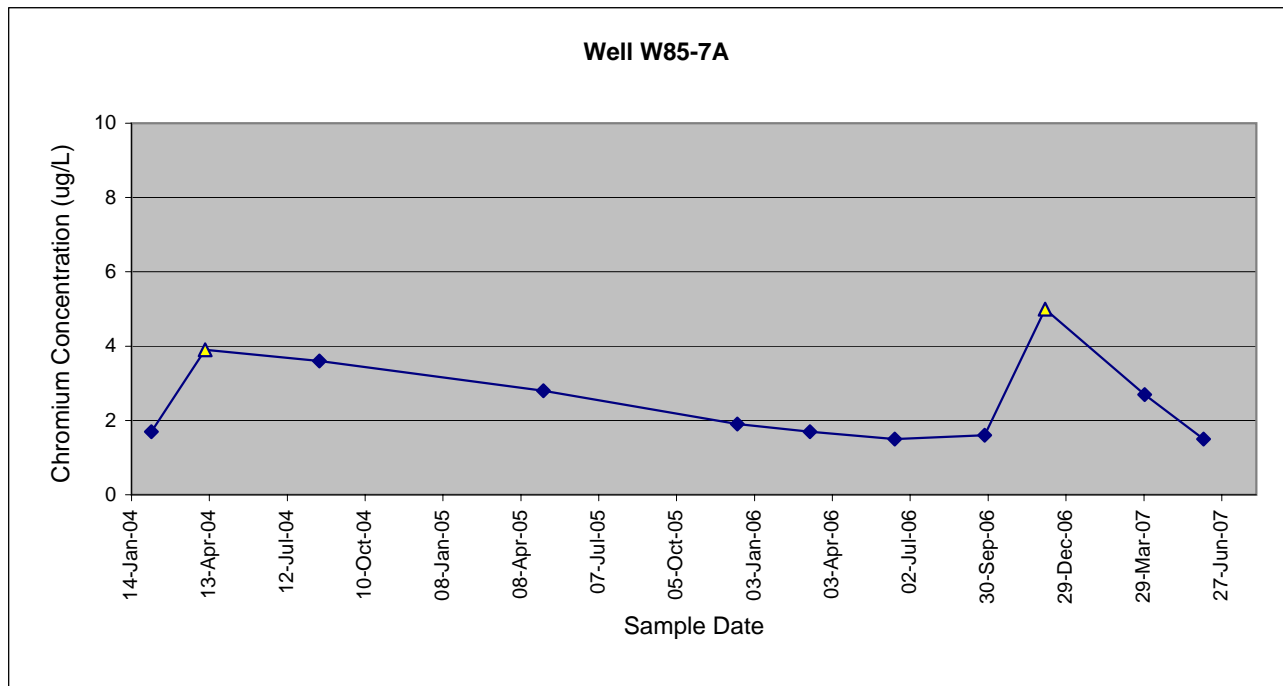
Well W97-18B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH7	Water	06-Feb-04	CHROMIUM	0.41	UG/L	J	W97-18B	Total	2
MJ2BK3	Water	7-Apr-04	CHROMIUM	1.5	UG/L	U	W97-18B	Total	0
MJ4740	Water	18-Aug-04	CHROMIUM	1.1	UG/L	J	W97-18B	Total	5
184245	Water	4-May-05	CHROMIUM	1.3	UG/L		W97-18B	Total	1.1
05504301	Water	14-Dec-05	CHROMIUM	1	UG/L		W97-18B	Total	1.1
104257	Water	8-Mar-06	CHROMIUM	0.5	UG/L	U	W97-18B	Total	1.4
244299	Water	13-Jun-06	CHROMIUM	1	UG/L		W97-18B	Total	6
394208	Water	27-Sep-06	CHROMIUM	1.3	UG/L		W97-18B	Total	3
494081	Water	2-Dec-06	CHROMIUM	5	UG/L	U	W97-18B	Total	0.2
134270	Water	1-Apr-07	CHROMIUM	0.88	UG/L		W97-18B	Total	2.1
234096	Water	6-Jun-07	CHROMIUM	1.2	UG/L		W97-18B	Total	0.7



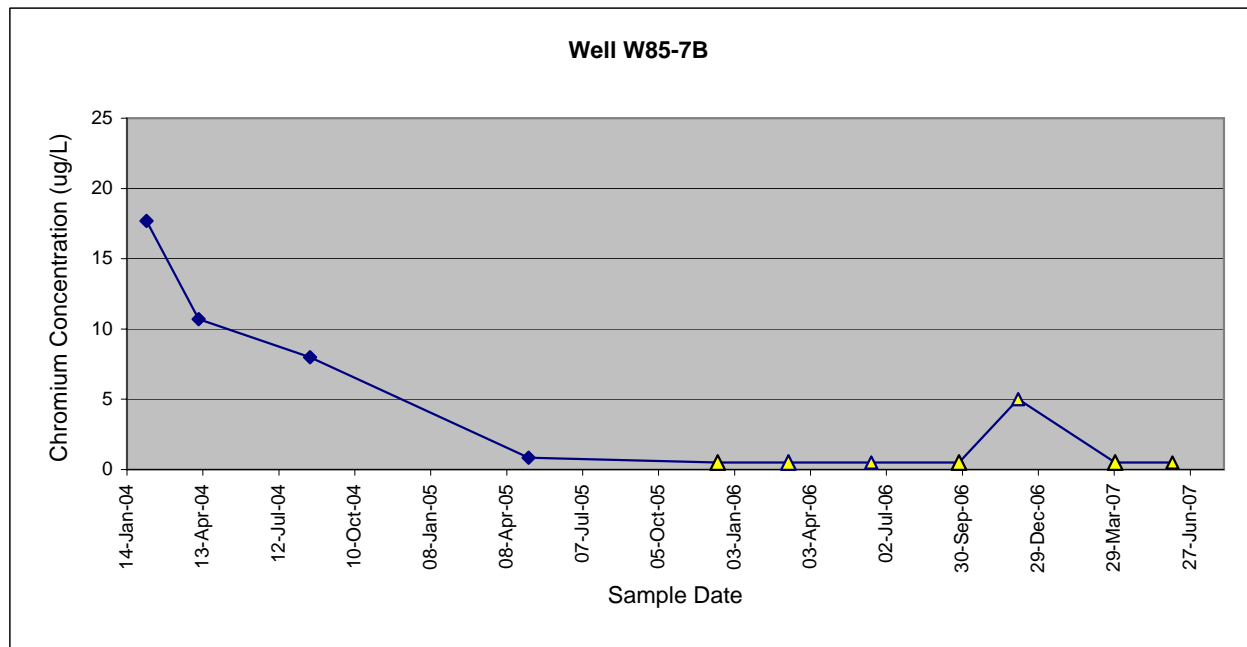
Well W85-7A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH8	Water	06-Feb-04	CHROMIUM	1.7	UG/L	J	W85-7A	Total	1
MJ2BK6	Water	8-Apr-04	CHROMIUM	3.9	UG/L	U	W85-7A	Total	0
MJ4741	Water	18-Aug-04	CHROMIUM	3.6	UG/L	J	W85-7A	Total	3
184239	Water	4-May-05	CHROMIUM	2.8	UG/L		W85-7A	Total	0.5
05504307	Water	14-Dec-05	CHROMIUM	1.9	UG/L		W85-7A	Total	0.2
104254	Water	8-Mar-06	CHROMIUM	1.7	UG/L		W85-7A	Total	0
244306	Water	14-Jun-06	CHROMIUM	1.5	UG/L		W85-7A	Total	0.2
394202	Water	26-Sep-06	CHROMIUM	1.6	UG/L		W85-7A	Total	0.1
494112	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W85-7A	Total	0.8
134247	Water	30-Mar-07	CHROMIUM	2.7	UG/L		W85-7A	Total	0
234083	Water	6-Jun-07	CHROMIUM	1.5	UG/L		W85-7A	Total	0.4



Well W85-7B

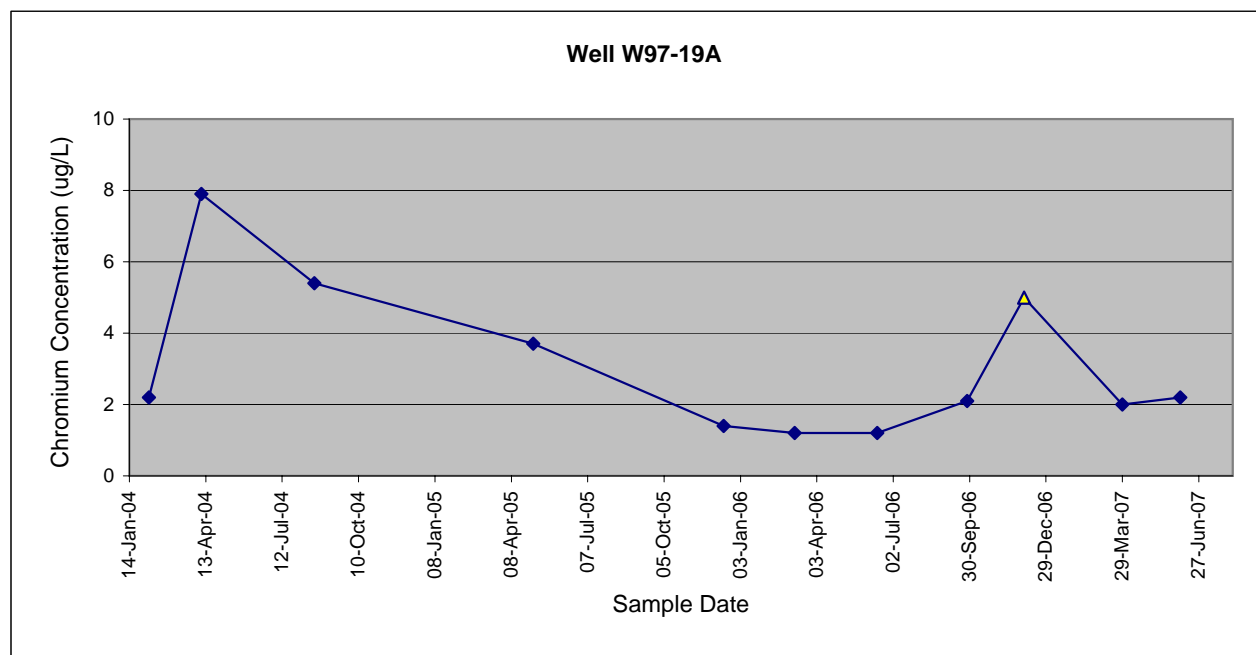
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AH9	Water	06-Feb-04	CHROMIUM	17.7	UG/L		W85-7B	Total	3
MJ2BK7	Water	8-Apr-04	CHROMIUM	10.7	UG/L		W85-7B	Total	0
MJ4742	Water	18-Aug-04	CHROMIUM	8	UG/L	J	W85-7B	Total	25
184240	Water	4-May-05	CHROMIUM	0.84	UG/L		W85-7B	Total	6.7
05504308	Water	14-Dec-05	CHROMIUM	0.5	UG/L	U	W85-7B	Total	1.4
104255	Water	8-Mar-06	CHROMIUM	0.5	UG/L	U	W85-7B	Total	0
244307	Water	14-Jun-06	CHROMIUM	0.5	UG/L	U	W85-7B	Total	0.7
394203	Water	26-Sep-06	CHROMIUM	0.5	UG/L	U	W85-7B	Total	0.8
494111	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W85-7B	Total	0.3
134248	Water	30-Mar-07	CHROMIUM	0.5	UG/L	U	W85-7B	Total	0.6
234084	Water	6-Jun-07	CHROMIUM	0.5	UG/L	U	W85-7B	Total	1.1



Note: Although turbidity was greater than 10 NTU, no filtered sample was collected.

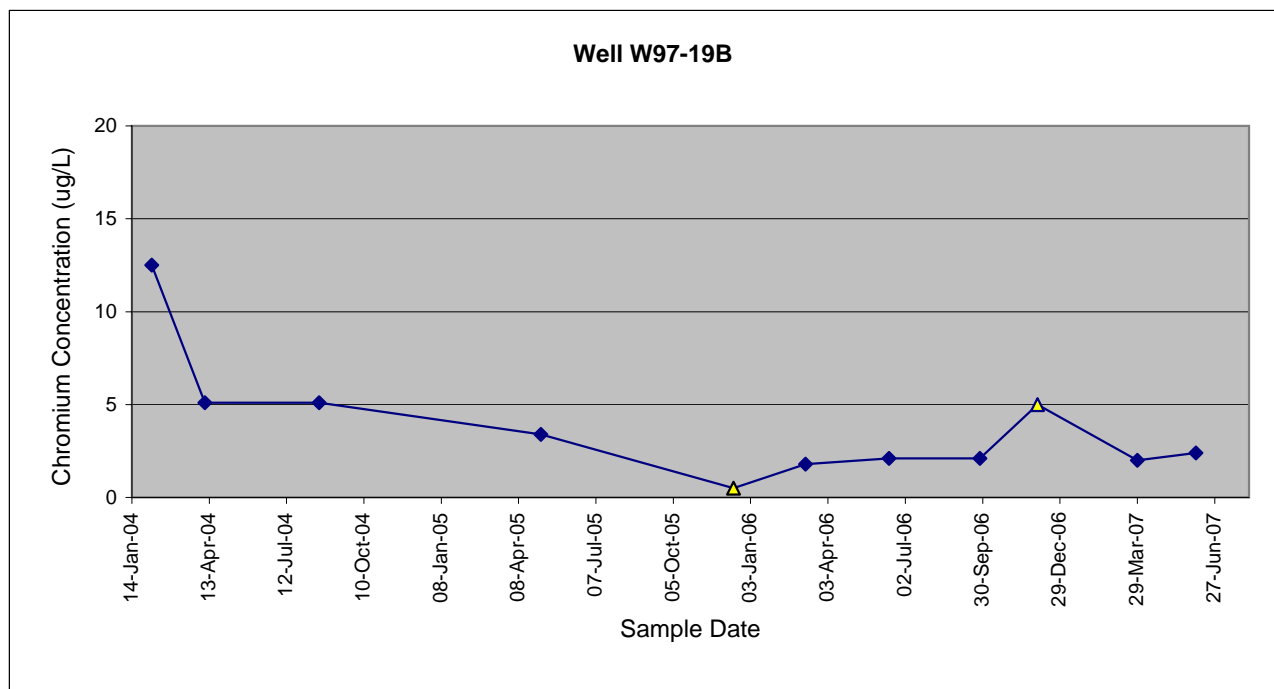
Well W97-19A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ0	Water	06-Feb-04	CHROMIUM	2.2	UG/L	J	W97-19A	Total	7
MJ2BK4	Water	8-Apr-04	CHROMIUM	7.9	UG/L	J	W97-19A	Total	2
MJ4749	Water	19-Aug-04	CHROMIUM	5.4	UG/L	J	W97-19A	Total	8
184242	Water	4-May-05	CHROMIUM	3.7	UG/L		W97-19A	Total	1.8
05504303	Water	14-Dec-05	CHROMIUM	1.4	UG/L		W97-19A	Total	0
104259	Water	8-Mar-06	CHROMIUM	1.2	UG/L		W97-19A	Total	1
244296	Water	13-Jun-06	CHROMIUM	1.2	UG/L		W97-19A	Total	1
394211	Water	27-Sep-06	CHROMIUM	2.1	UG/L		W97-19A	Total	0.4
494095	Water	3-Dec-06	CHROMIUM	5.0	UG/L	U	W97-19A	Total	1
134239	Water	29-Mar-07	CHROMIUM	2.0	UG/L		W97-19A	Total	3.3
234077	Water	5-Jun-07	CHROMIUM	2.2	UG/L		W97-19A	Total	1.8



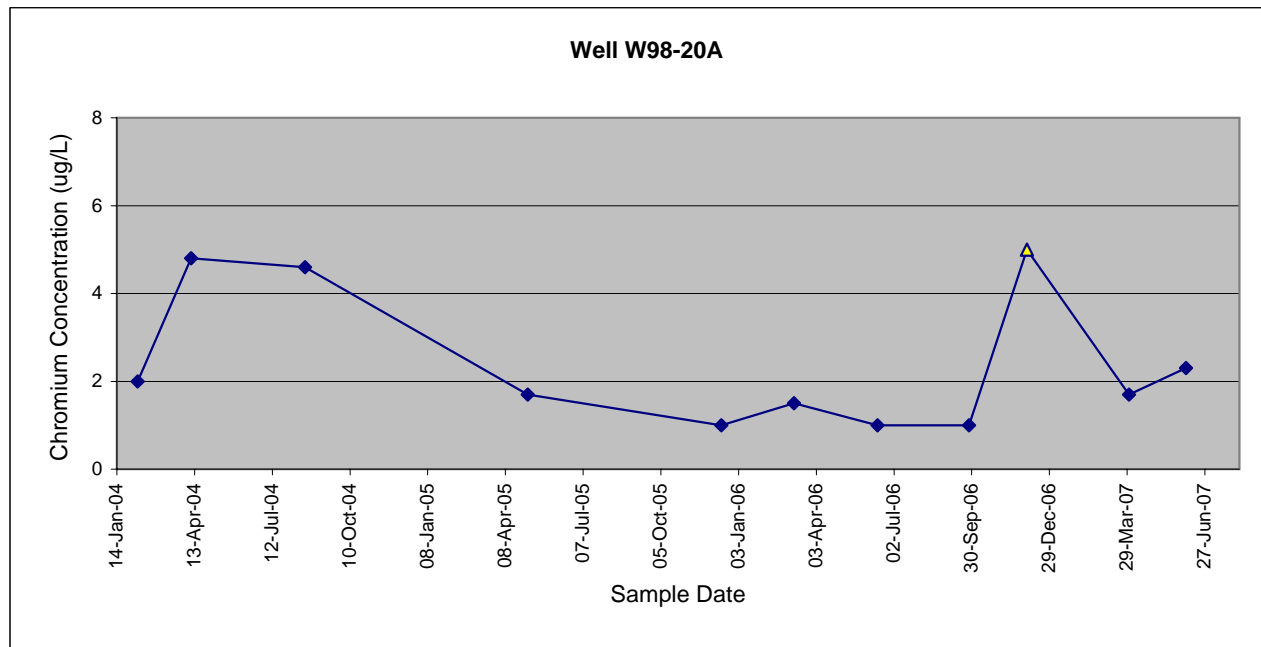
Well W97-19B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ1	Water	06-Feb-04	CHROMIUM	12.5	UG/L	J	W97-19B	Total	0
MJ2BK5	Water	8-Apr-04	CHROMIUM	5.1	UG/L	J	W97-19B	Total	1
MJ4750	Water	19-Aug-04	CHROMIUM	5.1	UG/L	J	W97-19B	Total	3
184243	Water	4-May-05	CHROMIUM	3.4	UG/L		W97-19B	Total	1
05504304	Water	14-Dec-05	CHROMIUM	0.5	UG/L	U	W97-19B	Total	0
104260	Water	8-Mar-06	CHROMIUM	1.8	UG/L		W97-19B	Total	5
244297	Water	13-Jun-06	CHROMIUM	2.1	UG/L		W97-19B	Total	0.5
394212	Water	27-Sep-06	CHROMIUM	2.1	UG/L		W97-19B	Total	1
494096	Water	3-Dec-06	CHROMIUM	5.0	UG/L	U	W97-19B	Total	1
134240	Water	29-Mar-07	CHROMIUM	2.0	UG/L		W97-19B	Total	6.9
234078	Water	5-Jun-07	CHROMIUM	2.4	UG/L		W97-19B	Total	1.9



Well W98-20A

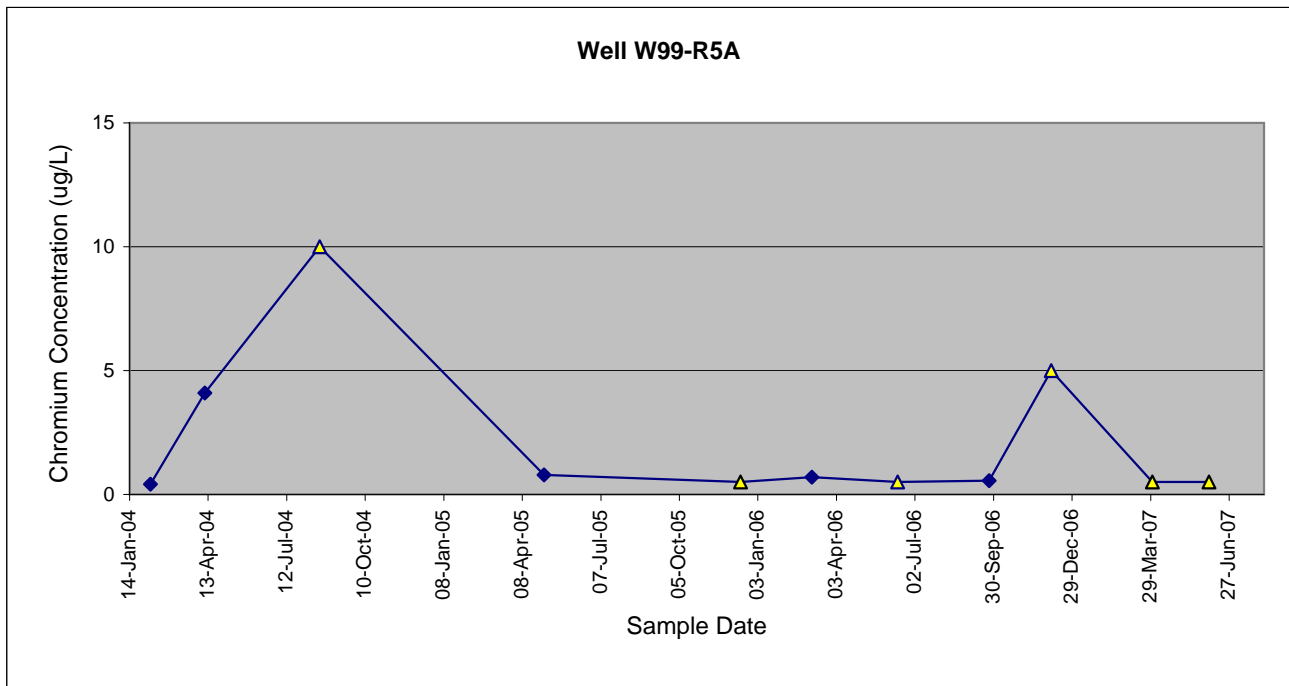
Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ2	Water	07-Feb-04	CHROMIUM	2	UG/L	J	W98-20A	Total	1
MJ2BL2	Water	9-Apr-04	CHROMIUM	4.8	UG/L	J	W98-20A	Total	0
MJ4752	Water	19-Aug-04	CHROMIUM	4.6	UG/L	J	W98-20A	Dissolved	20
184241	Water	4-May-05	CHROMIUM	1.7	UG/L		W98-20A	Total	0.5
05504302	Water	14-Dec-05	CHROMIUM	1	UG/L		W98-20A	Total	0
104258	Water	8-Mar-06	CHROMIUM	1.5	UG/L		W98-20A	Total	0
244300	Water	13-Jun-06	CHROMIUM	1	UG/L		W98-20A	Total	0.4
394210	Water	27-Sep-06	CHROMIUM	1	UG/L		W98-20A	Total	0.1
494097	Water	3-Dec-06	CHROMIUM	5	UG/L	U	W98-20A	Total	0.3
134263	Water	31-Mar-07	CHROMIUM	1.7	UG/L		W98-20A	Total	2.4
234076	Water	5-Jun-07	CHROMIUM	2.3	UG/L		W98-20A	Total	1.4



Note: Where a dissolved concentration is used, the NTU value listed is the pre-filtering value.

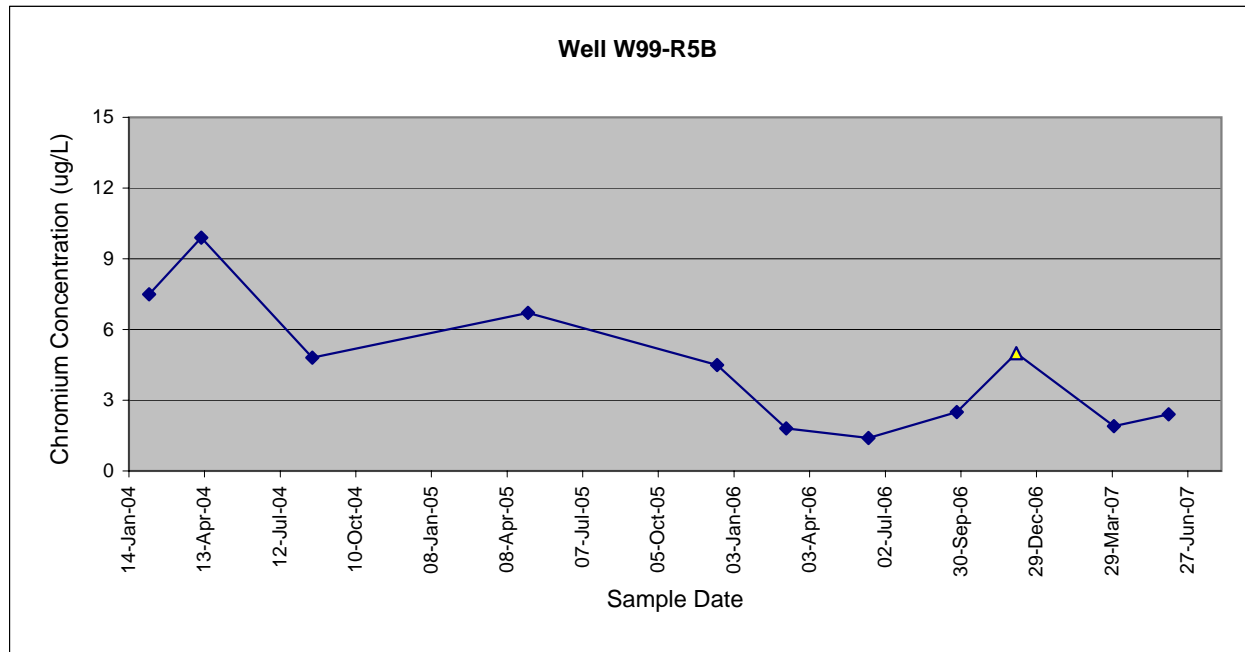
Well W99-R5A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ3	Water	07-Feb-04	CHROMIUM	0.41	UG/L	J	W99-R5A	Total	0
MJ2BL3	Water	9-Apr-04	CHROMIUM	4.1	UG/L	J	W99-R5A	Total	0
MJ4745	Water	19-Aug-04	CHROMIUM	10	UG/L	U	W99-R5A	Total	10
184230	Water	3-May-05	CHROMIUM	0.79	UG/L		W99-R5A	Total	1
05504305	Water	14-Dec-05	CHROMIUM	0.5	UG/L	U	W99-R5A	Total	0
104230	Water	6-Mar-06	CHROMIUM	0.7	UG/L		W99-R5A	Total	0
244280	Water	12-Jun-06	CHROMIUM	0.5	UG/L	U	W99-R5A	Total	1
394180	Water	25-Sep-06	CHROMIUM	0.55	UG/L		W99-R5A	Total	1
494115	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W99-R5A	Total	1
134264	Water	31-Mar-07	CHROMIUM	0.5	UG/L	U	W99-R5A	Total	0.3
234060	Water	4-Jun-07	CHROMIUM	0.5	UG/L	U	W99-R5A	Total	0.4



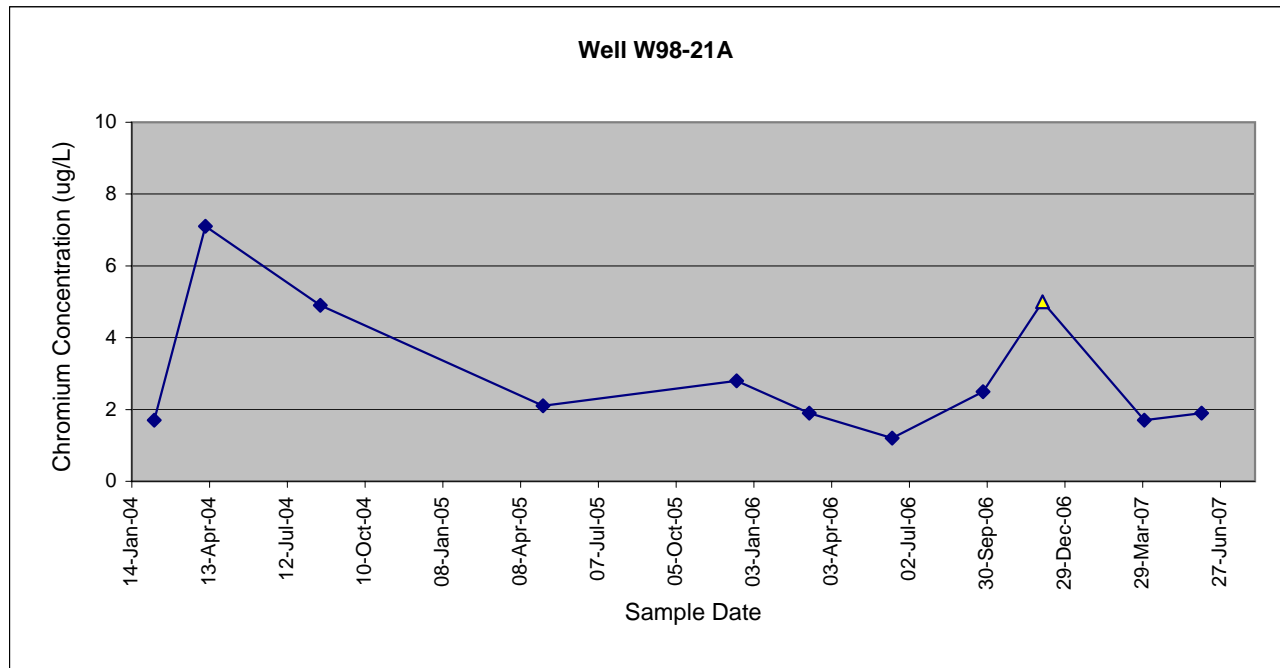
Well W99-R5B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ5	Water	07-Feb-04	CHROMIUM	7.5	UG/L	J	W99-R5B	Total	0
MJ2BL4	Water	9-Apr-04	CHROMIUM	9.9	UG/L	J	W99-R5B	Total	0
MJ4746	Water	19-Aug-04	CHROMIUM	4.8	UG/L	J	W99-R5B	Total	8
184231	Water	3-May-05	CHROMIUM	6.7	UG/L		W99-R5B	Total	2.3
05504306	Water	14-Dec-05	CHROMIUM	4.5	UG/L		W99-R5B	Total	2.1
104231	Water	6-Mar-06	CHROMIUM	1.8	UG/L		W99-R5B	Total	0
244281	Water	12-Jun-06	CHROMIUM	1.4	UG/L		W99-R5B	Total	3
394181	Water	25-Sep-06	CHROMIUM	2.5	UG/L		W99-R5B	Total	1
494116	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W99-R5B	Total	1
134265	Water	31-Mar-07	CHROMIUM	1.9	UG/L		W99-R5B	Total	10
234061	Water	4-Jun-07	CHROMIUM	2.4	UG/L		W99-R5B	Total	0.7



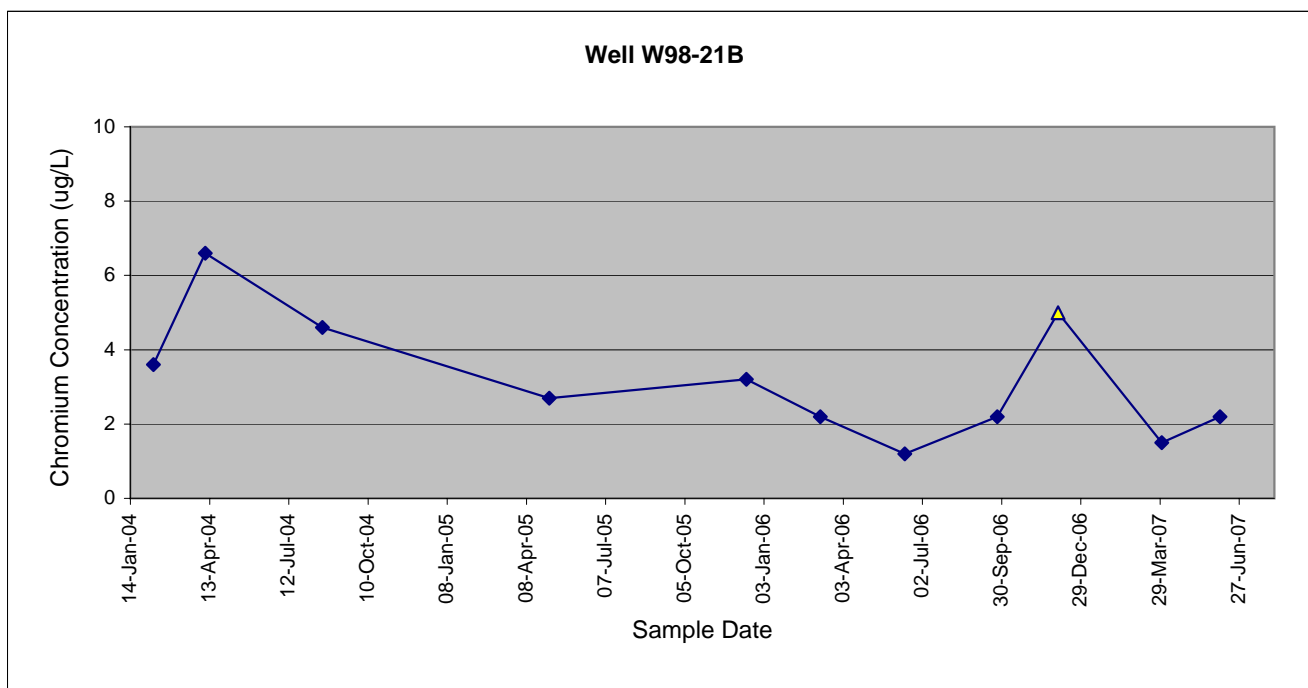
Well W98-21A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ6	Water	09-Feb-04	CHROMIUM	1.7	UG/L	J	W98-21A	Total	No Data
MJ2BK8	Water	8-Apr-04	CHROMIUM	7.1	UG/L	J	W98-21A	Total	0
MJ4743	Water	19-Aug-04	CHROMIUM	4.9	UG/L	J	W98-21A	Total	0
184237	Water	4-May-05	CHROMIUM	2.1	UG/L		W98-21A	Total	1.3
05504309	Water	14-Dec-05	CHROMIUM	2.8	UG/L		W98-21A	Total	0.1
104261	Water	8-Mar-06	CHROMIUM	1.9	UG/L		W98-21A	Total	0
244282	Water	12-Jun-06	CHROMIUM	1.2	UG/L		W98-21A	Total	0.3
394185	Water	25-Sep-06	CHROMIUM	2.5	UG/L		W98-21A	Total	0.2
494098	Water	3-Dec-06	CHROMIUM	5	UG/L	U	W98-21A	Total	0.1
134261	Water	31-Mar-07	CHROMIUM	1.7	UG/L		W98-21A	Total	0.2
234074	Water	5-Jun-07	CHROMIUM	1.9	UG/L		W98-21A	Total	0.9



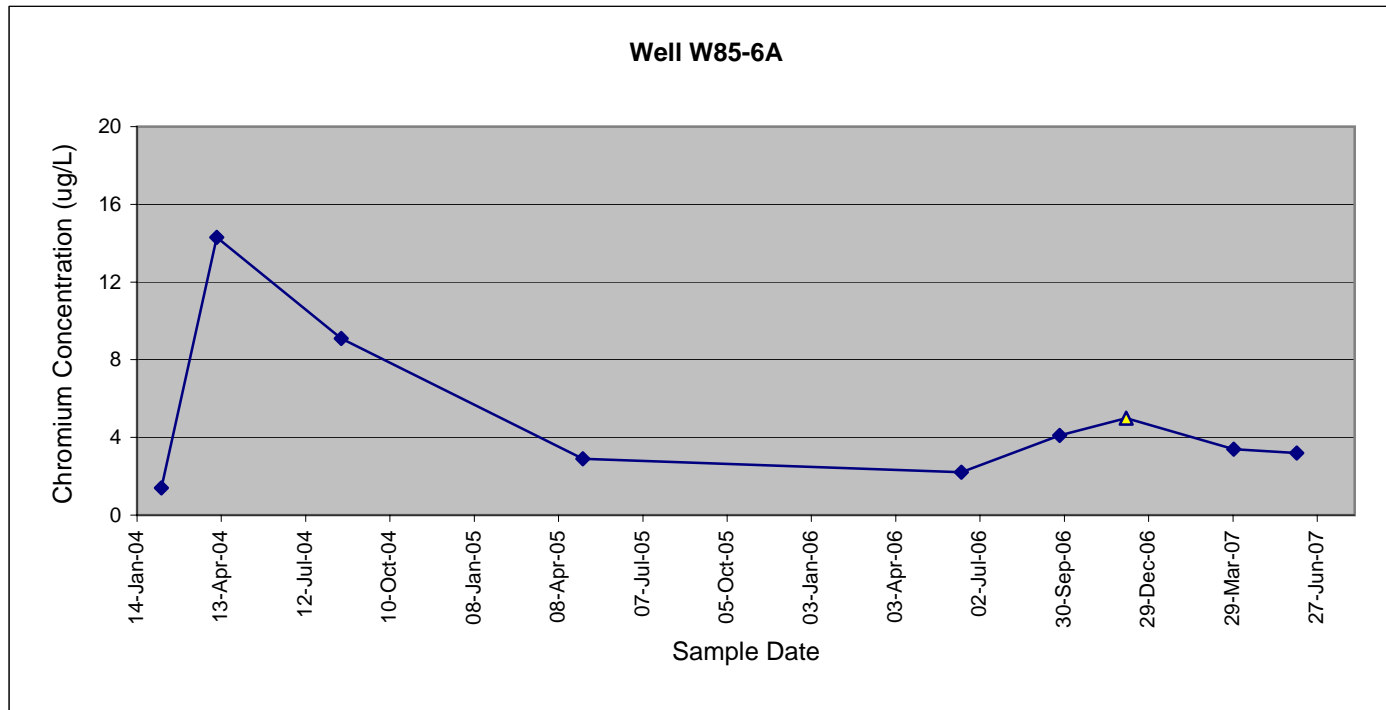
Well W98-21B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ7	Water	09-Feb-04	CHROMIUM	3.6	UG/L	J	W98-21B	Total	No Data
MJ2BK9	Water	8-Apr-04	CHROMIUM	6.6	UG/L	J	W98-21B	Total	0
MJ4744	Water	19-Aug-04	CHROMIUM	4.6	UG/L	J	W98-21B	Total	5
184238	Water	4-May-05	CHROMIUM	2.7	UG/L		W98-21B	Total	0.5
05504310	Water	14-Dec-05	CHROMIUM	3.2	UG/L		W98-21B	Total	0
104262	Water	8-Mar-06	CHROMIUM	2.2	UG/L		W98-21B	Total	0
244283	Water	12-Jun-06	CHROMIUM	1.2	UG/L		W98-21B	Total	0.3
394186	Water	25-Sep-06	CHROMIUM	2.2	UG/L		W98-21B	Total	0.1
494099	Water	3-Dec-06	CHROMIUM	5	UG/L	U	W98-21B	Total	0.2
134262	Water	31-Mar-07	CHROMIUM	1.5	UG/L		W98-21B	Total	0.1
234075	Water	5-Jun-07	CHROMIUM	2.2	UG/L		W98-21B	Total	0.2



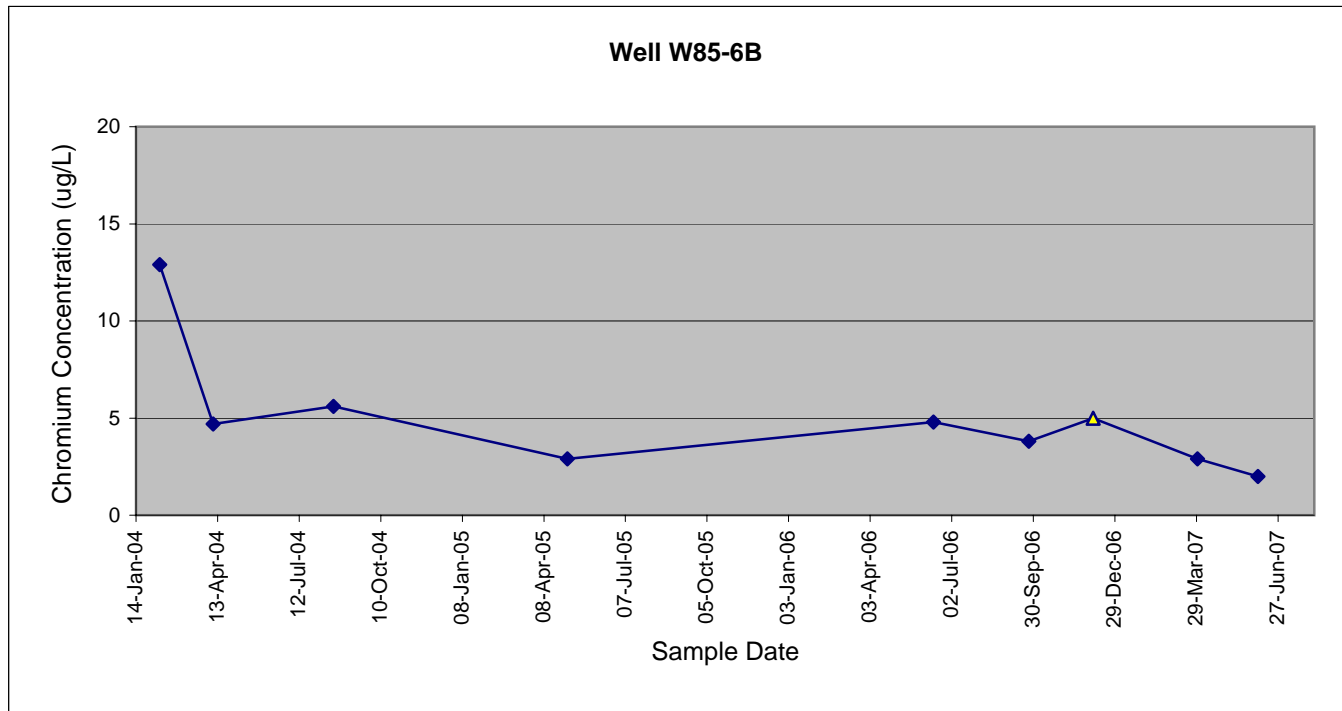
Well W85-6A

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ8	Water	09-Feb-04	CHROMIUM	1.4	UG/L	J	W85-6A	Total	No Data
MJ2BL0	Water	8-Apr-04	CHROMIUM	14.3	UG/L		W85-6A	Total	0
MJ4747	Water	19-Aug-04	CHROMIUM	9.1	UG/L	J	W85-6A	Total	<10
184235	Water	4-May-05	CHROMIUM	2.9	UG/L		W85-6A	Total	1
244284	Water	12-Jun-06	CHROMIUM	2.2	UG/L		W85-6A	Total	0.7
394182	Water	25-Sep-06	CHROMIUM	4.1	UG/L		W85-6A	Total	0.1
494113	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W85-6A	Total	2
134245	Water	30-Mar-07	CHROMIUM	3.4	UG/L		W85-6A	Total	0.5
234072	Water	5-Jun-07	CHROMIUM	3.2	UG/L		W85-6A	Total	0.2



Well W85-6B

Sample No.	Matrix	Sample Date	Analyte	Conc.	Units	Qualifier	Station Location	Notes	NTU
MJ2AJ9	Water	09-Feb-04	CHROMIUM	12.9	UG/L		W85-6B	Total	No Data
MJ2BL1	Water	8-Apr-04	CHROMIUM	4.7	UG/L	J	W85-6B	Total	0
MJ4748	Water	19-Aug-04	CHROMIUM	5.6	UG/L	J	W85-6B	Total	5
184236	Water	4-May-05	CHROMIUM	2.9	UG/L		W85-6B	Total	1
244286	Water	12-Jun-06	CHROMIUM	4.8	UG/L		W85-6B	Total	49
394183	Water	25-Sep-06	CHROMIUM	3.8	UG/L		W85-6B	Total	14
494114	Water	5-Dec-06	CHROMIUM	5	UG/L	U	W85-6B	Total	9
134246	Water	30-Mar-07	CHROMIUM	2.9	UG/L		W85-6B	Total	4.6
234073	Water	5-Jun-07	CHROMIUM	2.0	UG/L		W85-6B	Total	1.8



APPENDIX B
LABORATORY DATA SHEETS

CHROMIUM

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

July 23, 2007

Subject: Metals Frontier Hardchrome - 23

Project No: 150007

Officer: Guy Barrett

By: Dean Momohara

Summary

The calibration checks associated with several samples for total vanadium failed. The samples were qualified as estimates. Several matrix spike recoveries were not calculated due to insufficient spike. The internal standard failed for two results for total barium and one result for total silver. The results were qualified as estimates. All aluminum results were qualified as estimates due to matrix interference. The total nickel and total vanadium reporting limits were raised to 0.5 ppb and 1.0 ppb, respectively, due to instrument drift. No other problems were encountered in the analyses of these samples. All other sample results were reported without qualification.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Methods

The samples were analyzed and/or digested using the following methods: EPA method 200.7 for the digestion and analysis of minerals and EPA method 200.8 (ICPMS) for the digestion and analysis of trace metals.

Sample Information

Samples were received by Manchester Environmental Laboratory on 06/08/07. All coolers were received within the proper temperature range of 0°C - 6°C. The samples were received in good condition and were properly preserved. Forty (40) samples were received and assigned laboratory identification numbers 234060 – 234079 and 234580 - 234599.

Holding Times

All analyses were performed within established EPA holding times.

Calibration

Instrument calibrations and calibration checks were performed in accordance with the appropriate method. Except for several continuing calibration checks for total vanadium, all initial and continuing calibration checks (CCV) were within control limits.

Several associated CCVs for samples 234062, 234064 – 234066, 234580, 234582, 234585, 234592 – 234597, and 234599 for total vanadium failed. The samples were qualified as estimates. ICPMS calibration correlation coefficients were within the acceptance range of 1.000 - 0.995. The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Matrix Spikes

The matrix spike (MS) recoveries for total potassium for sample 234079 and for dissolved sodium, magnesium and calcium for sample 234589 were not calculated. The standard spiking level was insufficient for the elevated concentration of analyte in the source sample and no action was taken.

All other MS recoveries were within the acceptance limits of 75% - 125%.

Replicates

All duplicate relative percent differences were within the acceptance range of 0% - 20%.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits of 85% - 115%.

Internal Standards

The internal standard recoveries associated with samples 234585 and 234592 for total barium and with sample 234560 for total silver failed. The results were qualified as estimates. All other internal standard recoveries were within acceptance limits of 60% - 125%.

Other Quality Assurance Measures and Issues

The results for total and dissolved aluminum were qualified as estimates. The samples contained matrix interference that caused the background to be elevated in each sample.

U - The analyte was not detected at or above the reported result.

UJ - The analyte was not detected at or above the reported estimated result.

J - The analyte was positively identified. The associated numerical result is an estimate.

NC - Not Calculated

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Chromium

Project Name: Frontier Hardchrome - 23

LIMS Project ID: 1500-07

Project Officer: Guy Barrett

Method: EPA200.8

Date Reported: 07/03/07

Analyte: Chromium

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
07234060		W99-R5A	Water	0.50	U	ug/L	06/04/07	06/28/07
07234060		LMX1 (matrix spike)		107		%	06/04/07	06/28/07
07234060		LMX2 (matrix spike)		108		%	06/04/07	06/28/07
07234061		W99-R5B	Water	2.4		ug/L	06/04/07	06/28/07
07234062		RA-MW-14A	Water	1.6		ug/L	06/04/07	06/28/07
07234063		RA-MW-14B	Water	0.66		ug/L	06/04/07	06/28/07
07234064		RA-MW-17A	Water	4.9		ug/L	06/04/07	06/28/07
07234065		RA-MW-13A	Water	1.1		ug/L	06/04/07	06/28/07
07234066		RA-MW-13B	Water	0.50	U	ug/L	06/04/07	06/28/07
07234067		RA-MW-13C	Water	0.91		ug/L	06/04/07	06/28/07
07234068		RA-MW-15A	Water	4.0		ug/L	06/04/07	06/28/07
07234071		RA-MW-15B	Water	41.0		ug/L	06/04/07	06/28/07
07234072		W85-6A	Water	3.2		ug/L	06/05/07	06/28/07
07234073		W85-6B	Water	2.0		ug/L	06/05/07	06/28/07
07234074		W98-21A	Water	1.9		ug/L	06/05/07	06/28/07
07234075		W98-21B	Water	2.2		ug/L	06/05/07	06/28/07
07234076		W98-20A	Water	2.3		ug/L	06/05/07	06/28/07
07234077		W97-19A	Water	2.2		ug/L	06/05/07	06/28/07
07234078		W97-19B	Water	2.4		ug/L	06/05/07	06/28/07
07234079		RA-MW-12C	Water	4.2		ug/L	06/05/07	06/28/07
07234580		RA-MW-12A	Water	107		ug/L	06/05/07	06/28/07
07234582		RA-MW-12B	Water	3.0		ug/L	06/05/07	06/28/07
MB07176I1		Lab BLNK	Water	0.50	U	ug/L		06/28/07
ML07176I1		Lab LCS-	Water	106		%		06/28/07

Authorized By: M. J. [Signature]

Release Date: 7/3/07

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Chromium

Project Name: Frontier Hardchrome - 23

LIMS Project ID: 1500-07

Project Officer: Guy Barrett

Method: EPA200.8

Date Reported: 07/03/07

Analyte: Chromium

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
07234583		W85-7A	Water	1.5		ug/L	06/06/07	06/28/07
07234583		LMX1 (matrix spike)		108		%	06/06/07	06/28/07
07234583		LMX2 (matrix spike)		107		%	06/06/07	06/28/07
07234584		W85-7B	Water	0.50	U	ug/L	06/06/07	06/28/07
07234585		RA-MW-16A	Water	2.6		ug/L	06/06/07	06/28/07
07234586		RA-MW-16B	Water	6.97		ug/L	06/06/07	06/28/07
07234588		B87-8	Water	131		ug/L	06/06/07	06/28/07
07234590			Water	96.4		ug/L	06/06/07	06/28/07
07234591		B85-4	Water	2.4		ug/L	06/06/07	06/28/07
07234592		B85-3	Water	3.6		ug/L	06/06/07	06/28/07
07234593		W92-16A	Water	0.94		ug/L	06/06/07	06/28/07
07234594		W92-16B	Water	2.6		ug/L	06/06/07	06/28/07
07234595		W97-18A	Water	0.50	U	ug/L	06/06/07	06/28/07
07234596		W97-18B	Water	1.2		ug/L	06/06/07	06/28/07
07234597		RA-MW-11A	Water	4.3		ug/L	06/07/07	06/28/07
07234599		RA-MW-11B	Water	3.4		ug/L	06/07/07	06/28/07
MB07176I2		Lab BLNK	Water	0.50	U	ug/L		06/28/07
ML07176I2		Lab LCS-	Water	106		%		06/28/07

Authorized By: M. Jones

Release Date: 7/3/07

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Chromium, Dissolved

Project Name: Frontier Hardchrome - 23

LIMS Project ID: 1500-07

Project Officer: Guy Barrett

Method: EPA200.8

Date Reported: 07/20/07

Analyte: Chromium

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
07234069		RA-MW-15B	Field Filtered water	2.4		ug/L	06/04/07	07/19/07
07234070			Field Filtered water	2.3		ug/L	06/04/07	07/19/07
07234581		RA-MW-12A	Field Filtered water	4.6		ug/L	06/05/07	07/19/07
07234587		RA-MW-16B	Field Filtered water	1.4		ug/L	06/06/07	07/19/07
07234589		B87-8	Field Filtered water	9.19		ug/L	06/06/07	07/19/07
07234589		LMX1 (matrix spike)		92		%	06/06/07	07/19/07
07234589		LMX2 (matrix spike)		93		%	06/06/07	07/19/07
07234598		RA-MW-11A	Field Filtered water	3.96		ug/L	06/07/07	07/19/07
MB07200I1		Lab BLNK	Water	0.50	U	ug/L		07/19/07
ML07200I1		Lab LCS-	Water	103		%		07/19/07

Authorized By: M. Jones

Release Date: 7/20/07

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APPENDIX C
DATA VALIDATION MEMORANDUM

EXCEPTION SUMMARY FOR LABORATORY DATA QUALITY ASSURANCE REVIEW

DATA SUMMARY

The laboratory data quality assurance review and validation of analytical results for 40 water samples, Project Number 1500-07, collected between 04 and 07 June 2007 from the Frontier Hard Chrome site has been completed. This review incorporates sample results for other metals for assessment purposes, but applies only to the following analyses:

- Total recoverable and dissolved chromium by Washington State Department of Ecology's (WDOE) Manchester Environmental Laboratory (MEL), of Port Orchard, Washington, following EPA Method 200.8 – inductively-coupled plasma/mass spectrometry (IC/MS).

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. A data review was performed by the laboratory QA section on laboratory quality control results to ensure they met method quality objectives for the project. Data review followed the format outlined in the *National Functional Guidelines for Inorganic Data Review* (EPA 2004), modified to include specific criteria specified in the *Frontier Hard Chrome Long-Term Monitoring Plan* (Work Plan; Weston 2004). Raw laboratory data including calibrations, sample login forms, sample preparation logs and bench sheets, mass spectral tuning data, and raw instrument data were not available for this review.

This is an exception summary. All laboratory quality assurance results as applicable (e.g., holding times; blank sample analysis, matrix spike/duplicate spike analysis, and laboratory control sample analysis results) supplied to Weston for the analyses met acceptance criteria specified in the Work Plan (Weston 2004), with no exceptions noted for chromium analyses.

DATA QUALIFICATION

No QA/QC exceptions were noted in the data review associated with the analysis of total recoverable and dissolved chromium. Upon consideration of the data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use.

DATA QUALIFIERS

If required, any data qualifiers applied by the laboratory have been removed from the data summary sheets and superseded by data validation qualifiers.

The following data validation qualifiers were used to modify the data quality and usefulness of individual analytical results.

U - The analyte was not detected at the given quantitation limit.

DATA ASSESSMENT

Data review was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project.

This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgment the data are acceptable for use except where qualified with qualifiers that modify the usefulness of those individual values.

Original signed

R. Paul Swift, Ph.D., P.E.
Chief Chemist

July 31, 2007

Date